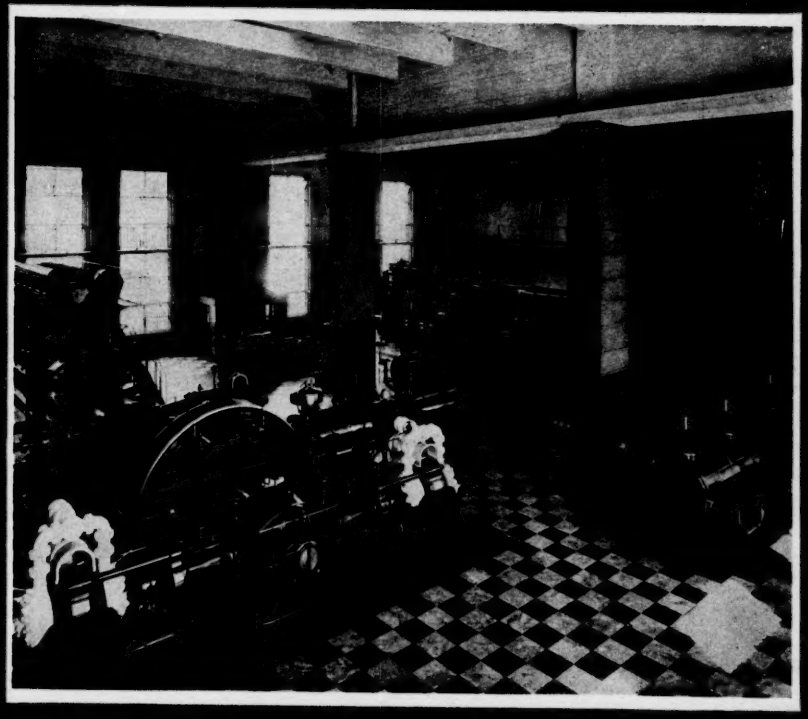
ICE and REFRIGERATION



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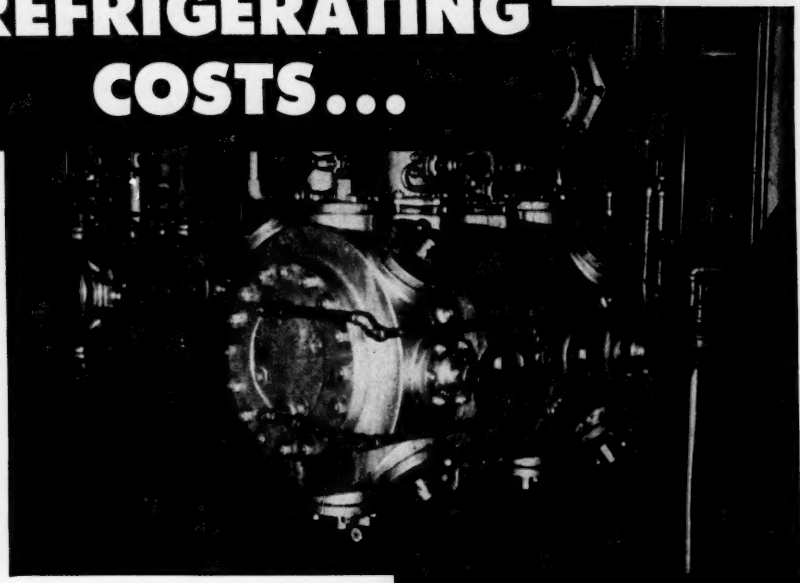
FEBRUARY • 1951

Truck Survey Shows Their Use for Ice Delivery ... Page 22

CUT YOUR REFRIGERATING COSTS...



Maintenance costs for refrigerating compressors come down when you lubricate with *Texaco Capella Oils*. That's because cleaner operation of both compressor and system is assured. Trouble-free performance follows for the same reason, along with a higher output of refrigeration tonnage.

Texaco Capella Oils are specially refined and processed for compressor lubrication. That means they have very low pour tests, very high resistance to oxidation. You'll have no carbon, gum or sludge problems with *Texaco Capella Oils*. You'll find compressor piston rings stay free and valves function properly for highest efficiency.

In addition, *Texaco Capella Oils* are moisture-free and do not react with refrigerants. Use the viscosities recommended for your particular compressors and operating conditions. A Texaco Lubrication Engineer will gladly help you.

Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO Capella Oils

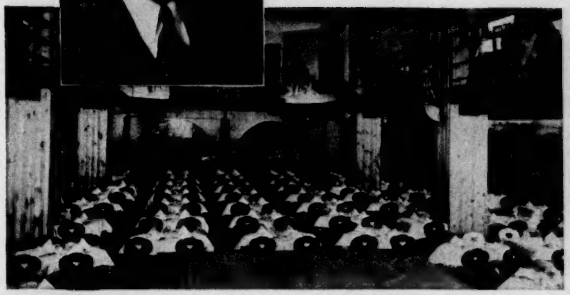
FOR ALL AIR CONDITIONING AND REFRIGERATING EQUIPMENT

TEXACO

TUNE IN . . . TEXACO presents MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA radio broadcasts every Saturday afternoon.

"Your Ice Bag is a godsend...keeps ice 100% clean and sanitary"

reports Herman Pirchner of Cleveland's Alpine Village



Alpine Village, in Playhouse Square, is Cleveland's only theatre restaurant. For 15 years it has been known as the smart spot for fine food before and after the theatre.

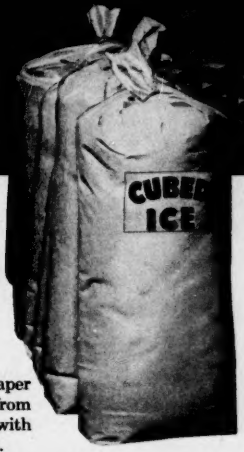
Let the Union One-Trip Ice Bag Be Your Star Salesman

LIKE HUNDREDS of other leading restaurants, Herman Pirchner's famous Alpine Village buys processed ice from a company using Union Paper Ice Bags.

Let that be a tip to you! Stake a firm claim to the big users of processed ice by demonstrating the superior features of the Union Ice Bag.

Show how the wire tie locks out dirt, bars pilferage and spillage. Show how the double layer of wet-strength Kraft paper retards melting. Explain why icing from a handy paper bag and doing away with re-usable containers cuts labor costs.

Consider your own operation, too! Union Paper Ice Bags speed up handling at ice processor, loading platform, delivery point. You sell more ice at lower cost when you use Union Paper Ice Bags.



Wet-Strength Paper Ice Bags have tremendous strength even when soaking wet... thanks to a water repellent resin that binds the fibres of the paper firmly together.

ONE TRIP

UNION Paper Ice Bags

A product of the UNION BAG & PAPER CORPORATION • 253 Broadway, New York 7, N. Y.

Bags of Kraft, Transparent Films, Waxed Paper, Glassine, Laminates

SUNISO RESTORES COMPRESSOR EFFICIENCY

Hotel Turns to Suniso for Its Ice-making Equipment; Separation Troubles Eliminated, Oil Costs Cut 20%

A hotel using a 15-ton ammonia compressor in making ice had constant trouble with the oil in the splash and force-feed systems. It discolored badly and failed to separate properly from the refrigerant. Furthermore, excessive amounts of oil carried over into the separators, lowering the efficiency of the entire system.

After consulting a Sun representative, the hotel switched to a "Job Proved" Suniso Oil, and has been using it for over three years with complete satisfaction. It maintains its color, separates properly from the refrigerant, and has reduced oil consumption 20 percent. As a result the hotel has adopted Suniso to lubricate the splash system of its two-ton ammonia compressor as well.

It is performance such as this that has made Suniso Oils the predominant choice of original equipment manufacturers. Available in six different grades, Suniso Oils have exceptionally low pour and wax separation points. They have high dielectric strength and unusual resistance to chemical change when mixed with Freon or other modern refrigerants. For a copy of the 52-page illustrated bulletin "Lubrication of Refrigeration and Air-Conditioning Equipment" write Department IR-2.

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ICE and Refrigeration

VOLUME 120 NUMBER 2

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February, 1951

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TO CUT POWER COST

AND BOOST TONNAGE WITH

Vogt BRINE COOLERS

WRITE FOR COMPLETE DETAILS
ASK FOR BULLETIN BC2

DOWN GOES POWER COST AND UP GOES TONNAGE when old evaporators are replaced with modern, Vogt Brine Coolers. The reason . . . maximum evaporating surface packed into a minimum of space with correct design and sound construction the controlling factors.

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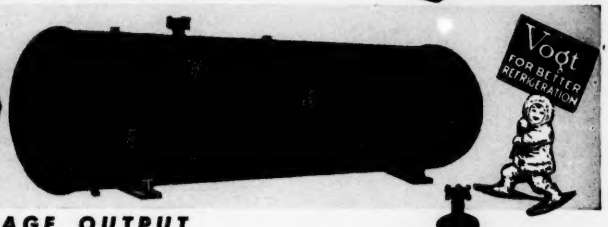
The cooler for closed brine systems in cold storage plants, dairies, packing plants, oil refineries, etc., requiring units of large capacity.

LOWER YOUR POWER COST

SINGLEPASS TYPE

Standard for ice freezing tanks and ideal where multiple can lifts are used. Large gas liberation area and rapid circulation of brine makes this a very efficient unit.



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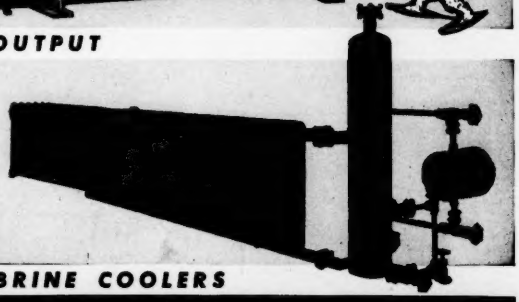
Recommended for ice freezing tanks and other refrigerating purposes where space is limited. The gas is quickly liberated and a high rate of heat transfer is effected.



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HENRY VOGT MACHINE CO., Inc., • • • • • LOUISVILLE 10, KENTUCKY

Branch Offices: New York — Chicago — Cleveland — Philadelphia — Dallas

To Better Serve The Ice Industry

S&S *Announces*

2 NEW F.O.B. POINTS AND SALES OFFICES

20th ANNIVERSARY

This is S&S Vending Machine Company's 20th year of pioneering and leadership in the ice vending field.

Now, for more convenient and economical shipping and service, we have established two new shipping points. They are located in Morrison, Illinois, and Hagerstown, Maryland.

Two additional sales offices have also been established, at Vincennes, Indiana, and Arlington, Virginia.

We believe that our long-time customers and friends throughout the country will welcome the new members of the organization and the improved service these changes will bring.

DANIEL A. PRAGER
Arlington, Virginia

Mr. Prager is our Regional Manager. Many of you know him, or of him, through his activities in the National Association of Ice Industries, with which he has been connected since early 1946 as Director of the Personnel Training and Marketing Department. He also organized and has been active in the Ice Merchandising Forums and the National Ice Marketing Institute.

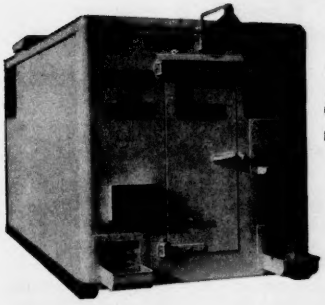
DON SCOTT
San Jose, Calif.

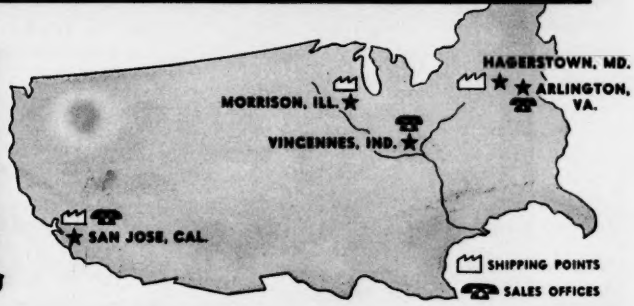
Mr. Scott, of course, is Sales Manager for the Company, at its headquarters plant in San Jose. He will continue to handle western customers and direct overall sales policies.

CLEM B. WISSING
Vincennes, Indiana

Mr. Wissing, our Branch Manager, is well-known in the ice industry, having been connected with leading firms in the field for many years and with the National Association of Ice Industries for nine years as Chairman of the Distribution Department.

S&S Venders and Stations NOW F. O. B. San Jose, California • Morrison, Illinois • Hagerstown, Maryland





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Here's visible

PROOF

of Vilter

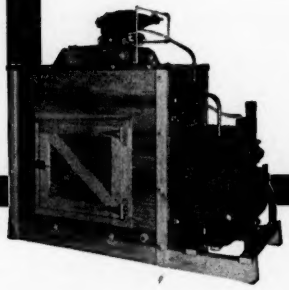
PakIce Superiority

VILTER PAKICE lasts longer—cools better—costs less to make—*TRIPLES* savings for you

The actual photographs you see above show what happened after a 22-hour test in a 70° room. Of 261 pounds of PakIce, 134 pounds remained. Of 316 pounds of crushed ice, 118 pounds remained. Fifty-five less pounds of PakIce started the test, while 16 pounds more PakIce finished this milk cooling test.

More than that, you can see that the PakIce held its shape better, didn't collapse to leave the milk unprotected. Indeed, PakIce forms an insulating, protective blanket that adds measurably to the cooling effect to double its advantage.

Perhaps best news of all is that you make PakIce yourself, as you need it, in the compact Vilter PakIcer. Ice costs with the Vilter PakIcer are far less than purchased ice, and the advantages of Crystalform PakIce result in further savings. Ask your Vilter representative to show you how much you can save by using Vilter PakIce in its natural form or in briquettes.



Vilter

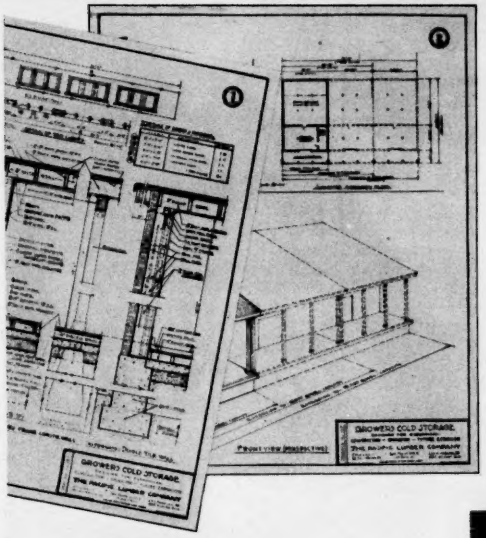
REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY
MILWAUKEE 7, WISCONSIN

Ammonia and Freon Compressors • Pak Icers • Evaporative and Shell and Tube Condensers • Pipe Coils • Valves and Fittings

INSTALLATION FILE NO. 1013

Growers' expansible cold storage with PALCO INSULATION WOOL



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(Use coupon below)

FLEXIBILITY SAFEGUARDS FUTURE — Properly insulated farm buildings are becoming increasingly necessary for profitable storage of apples, pears, grapes, potatoes, and a host of other fruits and vegetables. To provide for present needs and future additions as required, The Pacific Lumber Company offers carefully engineered detailed plans for expansible unit storage facilities.

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MODERN 11,000-BUSHEL APPLE STORAGE at Montrose, Michigan. Palco Wool Insulation was selected because it meets all requirements for produce storage: high thermal efficiency of .255 B.t.u.--resistant to moisture, vermin, fungus, and decay--non-settling, non-shrinking--imparts no odors --inherently fire resistant--flameproofed. Write for details today.

FROM NATURE'S INSULATION · AGE-OLD REDWOOD BARK · FLAMEPROOFED

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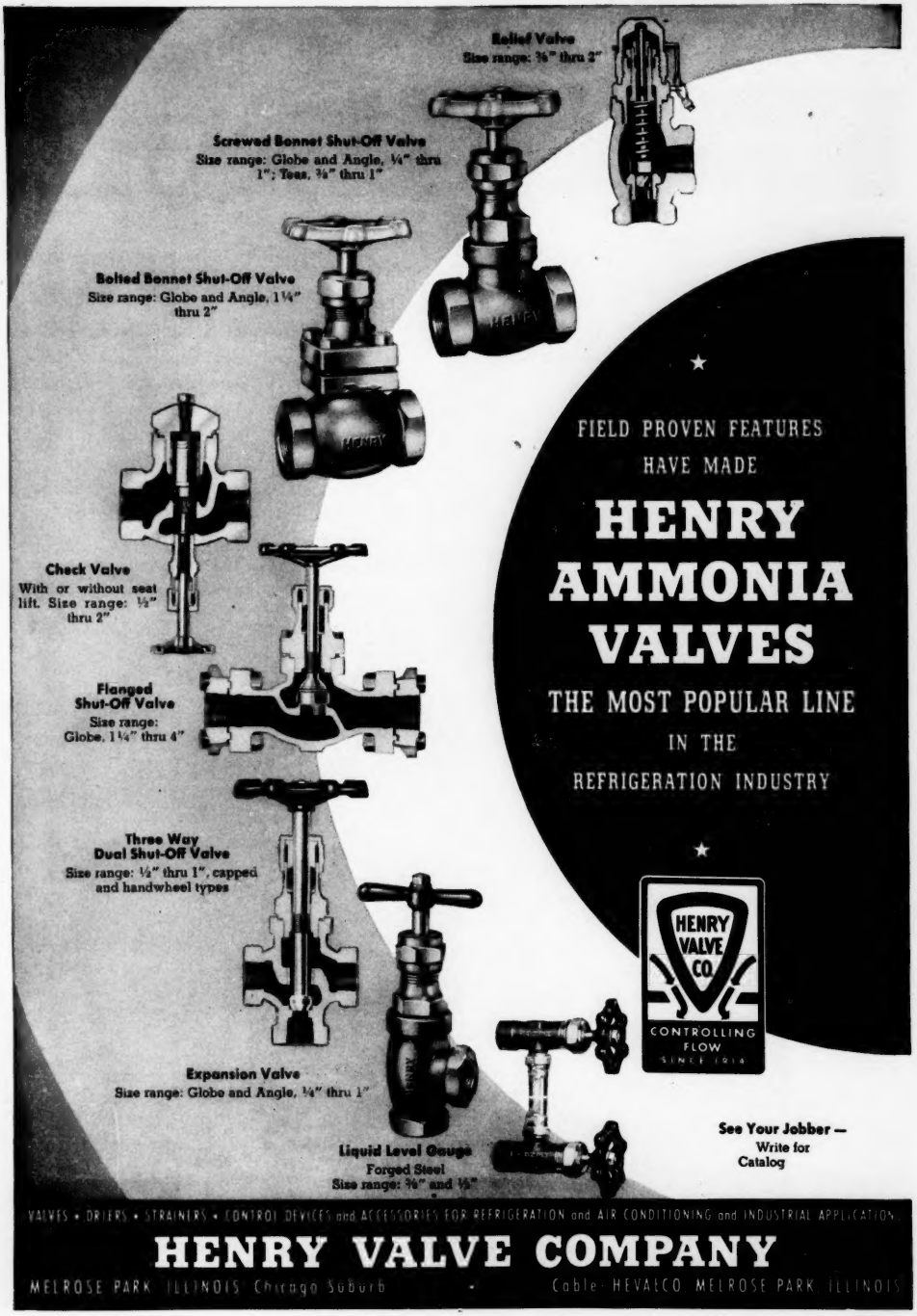
35 EAST WACKER DRIVE, CHICAGO 1, ILLINOIS

THE PACIFIC LUMBER COMPANY
100 BUSH STREET
SAN FRANCISCO 4, CALIFORNIA

Please send me without obligation:

☐ GROWERS' STORAGE PLANS
☐ PALCO WOOL COLD STORAGE MANUAL
☐ PALCO WOOL LOCKER PLANT MANUAL

Name_____
Title_____
Company_____
Street_____
City_____ Zone____ State_____


Relief Valve
Size range: 3/8" thru 2"
Screwed Bonnet Shut-Off Valve
Size range: Globe and Angle, 1/4" thru 1"; Tees, 3/8" thru 1"
Bolted Bonnet Shut-Off Valve
Size range: Globe and Angle, 1 1/4" thru 2"
Check Valve
With or without seat lift. Size range: 1/2" thru 2"
Flanged Shut-Off Valve
Size range: Globe, 1 1/4" thru 4"
Three Way Dual Shut-Off Valve
Size range: 1/2" thru 1", capped and handwheel types
Expansion Valve
Size range: Globe and Angle, 1/4" thru 1"
Liquid Level Gauge
Forged Steel
Size range: 3/8" and 1/2"
FIELD PROVEN FEATURES
HAVE MADE
HENRY AMMONIA VALVES
THE MOST POPULAR LINE
IN THE
REFRIGERATION INDUSTRY
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CONTROLLING FLOW
SINCE 1914
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Write for Catalog
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HENRY VALVE COMPANY
MELROSE PARK ILLINOIS Chicago Suburb
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FIRST LINE OF DEFENSE

America's Great Production Machine—once again the arsenal of democracy—runs on oil and grease. And, among buyers of industrial lubricants, Socony-Vacuum is the *first-choice supplier!* Here's why . . .

Famous Gargoyle lubricants are unsurpassed in quality—constantly improved by Socony-Vacuum research. They are backed by 85 years of lubrication experience . . . are recommended by more machine builders than the products of any other oil company. Performance records, in thousands of plants, prove they help increase production, reduce friction and power losses, lower maintenance costs.

Socony-Vacuum—with more lubrication engineers serving industry than any other oil company—can help improve production performance in *your* plant. Why not give us a call?

GARGOYLE Lubricants

SOCONY-VACUUM

Socony-Vacuum

Correct Lubrication

WORLD'S GREATEST LUBRICATION KNOWLEDGE AND ENGINEERING SERVICE

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY • GENERAL PETROLEUM CORPORATION

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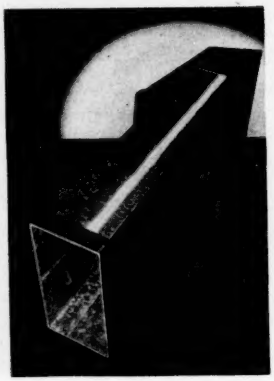


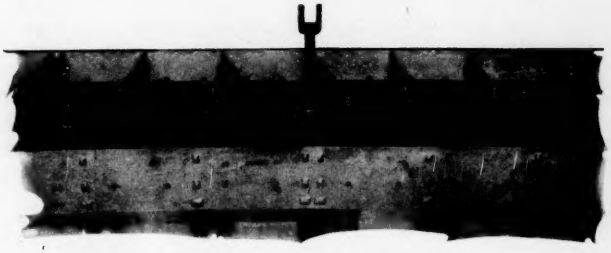
ICE CANS

WELDED OR RIVETED
IF IT IS AN ICE CAN
KNICKERBOCKER CAN CAN MAKE IT!

ANY SIZE — ANY STYLE
HIGH PRESSURE LOW PRESSURE
ARCTIC PAWNALL
ULINE BOTTOM

CAN GRIDS

VARIOUS—
DESIGNS
STYLES
WEIGHTS



CAN FILLERS

For one or more cans.
Will not Leak.
Accurate measurement each filling.

SANITARY

At Your Service — Representatives Everywhere

Cable Address: KNICKSTACO

KNICKERBOCKER STAMPING CO.
Parkersburg, W. Va.

In The Spotlight

REFRIGERATION is an important part of the process of brewing beer, and equipment must be kept up-to-date for efficient and economical operation. How this has been achieved with the help of automatic controls and modern evaporators over a period of years in a pioneer Chicago brewery is told in the article starting on page 13.

LUBRICATING OILS for refrigeration compressors have to meet a wide variety of temperatures from low to medium. Thus there has been created the need for specific products, which have been supplied by the refineries. This subject is covered in the article starting on page 16.

RISING TAXES will inflict an added burden of expense upon all business, and the wise business man will keep his tax obligations up-to-date and watch all operations in relation to tax rates throughout the entire year. This subject is analyzed and discussed from the viewpoint of the small business man in the article starting on page 19.

A NATION-WIDE survey of trucks used in the ice industry, covering size, age, mileage and other factors has been made by ICE AND REFRIGERATION. It shows that about 84 percent of all ice manufacturers provide delivery service. Other important contributions to the subject are included in the article starting on page 22.

MERCHANDISING and other subjects of current interest to members of the ice industry were discussed at the 31st annual convention of the California Association of Ice Industries. A report of the meeting is given in the article starting on page 26.

COVER PICTURE: The engine room of Carlsberg Breweries, Copenhagen, Denmark. This is the largest lager beer brewery in Scandinavia and has a very large export business. Refrigerant compressors are driven by both steam engines and internal combustion engines. Electric generating equipment is used in this attractive design which eliminates overhead piping.

A BREAKFAST MEETING was held at the 41st annual convention of the National Association of Practical Refrigerating Engineers to discuss methods for arranging programs for chapter meetings and other activities, including membership building, publicity, cooperation with industry, and planning special events. The suggestions and ideas brought out at this meeting are summarized in the article starting on page 41.

PROPOSED REVISED trade practice rules for the public refrigerated storage industry following a general trade practice conference held in Chicago, Ill., have been issued by the Federal Trade Commission, on which a hearing will be held at Boston, Mass., February 8, 1951. The proposed revised rules are published in the article starting on page 32.

PACKAGING of frozen foods and other perishable food products is important because proper packaging is needed to meet modern needs of warehousing and transportation. Talking to a group of packaging engineers, a refrigerated warehouseman touched the high spots of this process. His address is printed starting on page 34.

LETTERS

A RECENT letter from J. R. Shoemaker, president of the Hygeia Refrigerating Co., Elmira, N.Y., says he was interested to learn that Hygeia has been on the ICE AND REFRIGERATION subscription list since 1904, which was eight years after the business was organized in 1896 and two years before he came with the company in 1906. On Monday, January 15, he continues, he rounded out 45 years of activity in the refrigerated warehousing and ice manufacturing industries. This year also marks the end of their 30th year in the ice cream business, with a lesser number of years in the distribution of frozen foods and in locker plant service.

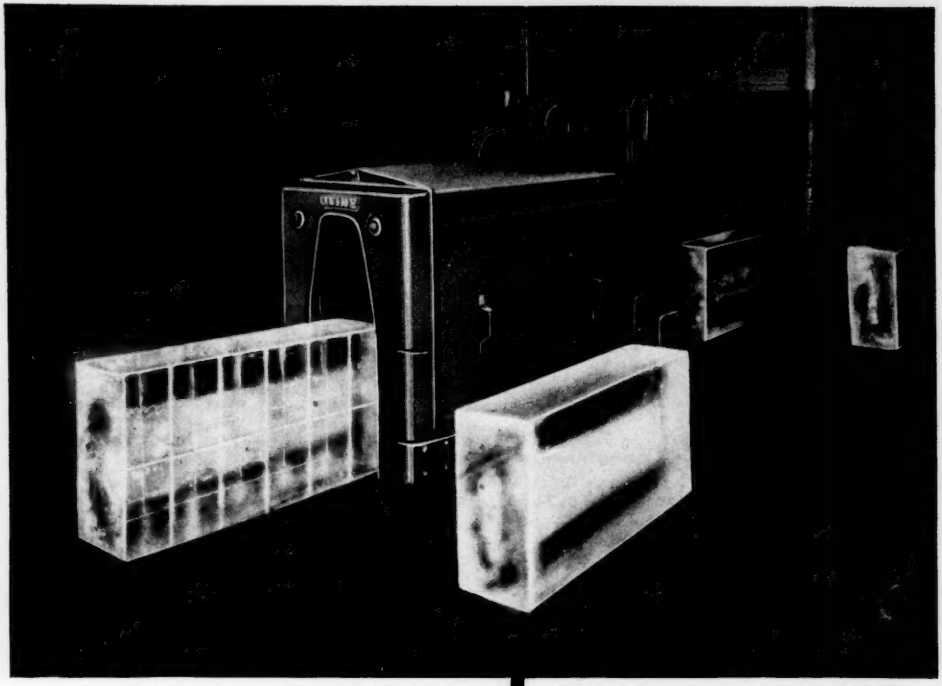
"The fur cold storage business which began in a small way very early in the company's history, has grown to be a very large and important segment of our operations. During this cycle, we have also been in and out of the refrigeration appliance business both ice and mechanical. I mention these items to indicate the diversification of our interests."

Two of Mr. Shoemaker's sons are associated with him in the business—Garth A., who is vice president and treasurer, and David R., who is assistant secretary and manager of the frozen foods division. The oldest son, Perry M., who is vice-president of the Lackawanna Railroad, is also a member of the Hygeia board of directors. These younger men are the third generation of the family to be actively associated with the business, as his father and older brother were among the original founders.

There are two other sons. Dick is Southeastern Sales Manager of the Air Tool Division of Ingersoll-Rand, with headquarters at Birmingham. Donald, the youngest, is in an executive position with Corning Glass Works.

"The mortality among independently owned and operated business enterprises in this country," he concludes, "has been high, and the road is not getting any easier under the present-day financial burdens imposed on business, especially through the discriminatory and unjust tax laws under which such business operates. We are therefore very grateful to have thus far weathered through the vicissitudes of the past half century."

PARTY ICE is the basis of consumer advertising in the 1951 Ice Advertising campaign, details of which are outlined in the article on page 21.



HANDLING COSTS

CAN BE CUT 3 WAYS

...with a G-W UM scoring machine

Investigate this completely automatic scorer-conveyor and see the big savings it can make in your plant. It is less than six feet long and barely three feet wide and can handle six 300 or 400 lb. cakes per minute. Its ruggedness is proved again and again by the many UM scorers still giving perfect service after 25 years of continuous use. Truly the greatest value ever offered in scoring machines. Write your nearest Gifford-Wood office for complete details.

1 By taking advantage *now* of a low initial cost!

Here is the greatest value ever offered in a quality scoring machine, built with the finest materials by craftsmen with years of experience in the ice industry.

2 By conveying and scoring at the same time!

As ice is moved from storage to platform through the UM Scorer-conveyor, the lengthwise and crosscut scoring operation takes place. That means big savings in labor costs, fast delivery at platform.

3 By using the UM scorer as a conveyor only!

When platform delivery of unscored ice is desired, simply press a lever, crosscut saws are disengaged. The scorer then functions as a conveyor. This two-in-one unit saves cost of installing and operating two separate machines.

GIFFORD-WOOD CO.

Since 1814
Hudson, New York

NEW YORK 17, N. Y. 420 LEXINGTON AVENUE
CHICAGO 6, ILL. 565 W. WASHINGTON ST.
ST. LOUIS 1, MO. RAILWAY EXCHANGE BUILDING

6727

When You Think of Material Handling — Think of GIFFORD-WOOD

Good Engineering Pays Dividends

Modern refrigeration equipment installed in Chicago brewery has made more efficient operation possible, reduced costs, and increased production capacity.

L. F. CLIFFORD

MANY changes have taken place in brewing since 1875 when Michael Sieben erected what is now Chicago's oldest brewery. A great number of these changes have been in refrigeration methods and equipment, refrigeration being one of the principal powerhouse ingredients used during the fermentation and aging in the manufacture of beer.

From the time wort or unfermented beer leaves the brew kettle until the beer is barreled and shipped, all operations require refrigeration. In addition to this, the hops and yeast used in the manufacture of beer are stored under refrigeration.

An increase in production capacity of several hundred percent over a period of years has resulted in more efficient use of refrigeration capacity. In spite of this greater product load, they have reduced their refrigeration tonnage from 70 to 40 tons. Even with this decrease their refrigeration compressor runs only about 96 hours per week in hot weather.

Automatic controls and modern evaporators provide economical application of refrigerating in Sieben's Brewery, Chicago, Ill. After prohibition ended, some breweries tried unit coolers in their refrigerated rooms and then tossed them out. The coolers were not designed for the work they were expected to do. The results were unsatisfactory.

More recent advances in design and application have changed the picture considerably. There is wide acceptance and use of the forced air cooling equipment. Other features of this well operated, moderate size brewery show how knowledge and careful engineering give good results in economy of operation.

Early Modernization

It was in 1896 that a Corliss engine driven Wolf Linde horizontal compressor was installed in Sieben's Brewery. It was a single cylinder, double acting machine. An opposing cylinder was added in 1916. Each cylinder was rated at 35 tons, giving the compressor a total capacity of 70 tons.

In 1939 a standby compressor was installed which was a vertical single acting 8½ by 8½ in. Wolf Linde rated at 39 tons. It is driven by a Troy Engberg automatic steam engine having a sliding adjustable cut-off which varies the compressor speed from 100 to 300 rpm. This compressor is now used as the main source of refrigeration with the other Wolf Linde serving as standby equipment.

When the vertical compressor was installed, hand expansion valves on the eight evaporator coils in the brewery had to be replaced with thermal valves. As many old-timers will recall, slow speed horizontal compressors were operated without too much regard of liquid slug back. The valve design permitted the liquid to flow by gravity through the valve without too much danger to the head. However, faster speed vertical compressors wouldn't stand up under this slugging.

It was found that thermal valves stopped refrigerant slugging by giving better control of the refrigerant entering the evaporator coils. It is true they had used a horizontal shell-and-tube heat exchanger in the liquid and suction lines. But even with this, slug backs occurred. Thermal valves give better refrigerant control and smoother, more economical operation because back pressures were reduced from 30 to 15 psi and volumetric efficiency increased by elimination of liquid slug back with its resulting re-expansion in the cylinder.

Due to this and other improvements in the refrigeration system, and better sizing of the cooling equipment, the plant can carry the load by running the vertical compressor during only the regular working hours of the brewery. During off-hours and over week-ends, a three ton Brunswick-Kroeschell compressor cuts in to cool the brine.

In the manufacture of the beer, hot wort from the brew-kettle is pumped through a stainless steel plate cooler to reduce its temperature from 210 to 40 F. Its capacity is 17,000 lbs. per hour. City water with a maximum temperature of 70 F flows through the initial section of the cooler and cools the wort from 210 to 80 F.

Hot Water Needs

This city water then goes to a hot water tank where it is further heated by exhaust steam from the engines. It is used for barrel washing, doughing in, sparging, and all other hot water needs in the plant.

The final section of the plate cooler has chilled water circulated through it and reduces the temperature of the wort from 80 to 40 F. The chilled water is recirculated through a vertical shell-and-tube heat exchanger which keeps its temperature constant. A Phillips liquid float and back-pressure valve holds the evaporator temperature at 28 F.

The plate cooler equipment was recently purchased from the Creamery Package Mfg. Co. This type of cooler takes up much less room than the original Baudelot cooler and keeps the wort entirely enclosed. Advanced opinion in the industry regards this change as an important improvement in plant operation.

The brew runs from the wort cooler to a starting tank where it is pitched with yeast. When fermentation is well started, the brew is transferred to a fermenting tank. The yeast grows and is buoyed up in the fermenting liquor by the carbon dioxide it releases. After fermentation it sinks to the bottom of the tank and the beer is drawn off above it.

During fermentation the temperature rises slowly at first, then at an increased rate and finally at a decreasing rate. This cycle of fermentation is controlled by the temperatures maintained by the brew-

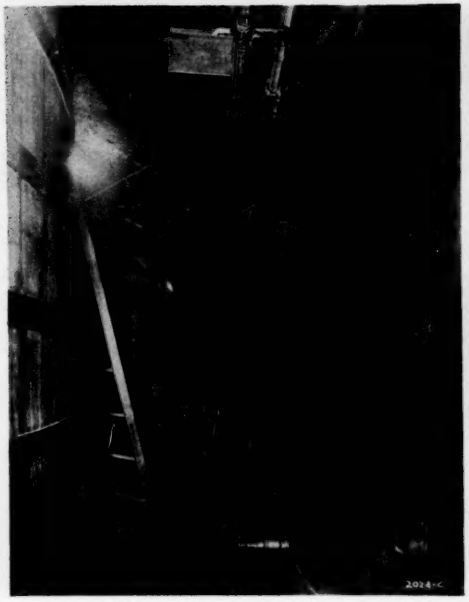
Sieben's Brewery. Few buildings except breweries retain the ornate exteriors of those earlier days. Inside, however, they too are considerably changed.

The refrigeration load in the cellars consists of the heat of fermentation; heat leakage and air infiltration from outside; and service loads of heat and moisture from workmen, lights, motors, and wash water. When all breweries used wooden vats, it was a rule of thumb practice to size pipe coils by the formula: One ft. of two in. pipe coil for each 15 cu. ft. of refrigerated space. This usually gave ample room cooling because the wooden walls of the vats retarded heat flow so efficiently. In fact, the pipe coils at Sieben's were oversized.

air come into contact with the tops of open fermenting tanks or impinge on the sides of the tanks. This would cause excessive currents of liquid within the fermenters due to too great temperature difference, or foam might be carried from the top of the open tanks and sprayed over the ceiling and walls of the room. For this reason, low velocity air cooling units are used.

Aging Tanks

When fermentation is complete, the beer is stored in lined wooden



Air units of Gebhardt design improve refrigeration in this cellar which otherwise is much like it was 75 years ago.

One of the remodeled cellars is almost completed. The air cooling units and refrigerant piping and controls are prominent.

master. Heat of fermentation is removed from the tanks by the surrounding room air which is cooled, and by passing refrigerated brine through cooling coils encircling the inside walls of the tanks. These coils or "attemperators" are fed through hand-operated valves. Fermentation temperatures range from 45 to 55 F.

The rate of fermentation varies each day of its fermentation period but the total heat is practically a daily constant because the brew is delivered to the fermenting tanks at a uniform rate. Since the heat generated is practically constant, it is equal to 280 Btu per lb. of maltose converted per barrel of brew.

However it is interesting to note that quite a few installers have lately used this formula for sizing room coils where steel vats were used. Heat flows from the fermenting liquor through the steel walls of the vats so rapidly that most of the heat load falls on the room coils with the result they don't have sufficient capacity. It is now generally conceded that rooms with steel vats must have their coils sized according to heat gain calculations, and not by rule of thumb. Of course this is always more satisfactory for any installation.

It is of utmost importance that air circulation in the fermentation room be at low velocity so no streams of

tanks for aging. The refrigeration load in the storage cellars consists of heat leakage, air infiltration, service loads, and the heat of krauesening for secondary fermentation. Originally all nine storage cellars were cooled with pipe coils. Recently seven of these cellars were changed from pipe coils to horizontal, low velocity air cooling units. These give more positive air circulation, and yet not enough motion to cause discomfort to the workmen. The other two cellars still have pipe coils because of structural impediments.

Since the tanks and vats are wooden, it is possible to shut down the refrigeration system on Saturday and

The racking room is light and well proportioned. Air units provide refrigeration.

start it up on Monday morning without affecting the quality of the product. Beer temperatures are 36.00 F at the time of shut down, and 36.25 F at the time of start up. Air temperatures in the rooms rise from 30 F to 50 or 52 F during the same time. It is the insulating effect of wood that prevents the beer from having a greater temperature rise.

It is important to keep refrigeration costs at a minimum. Since steam is used to power the engines that drive the refrigeration compressors, heat in the steam must be used to the maximum. Steam costs about 52 cents per 1,000 lb. with coal, but only 22 cents per 1,000 lb. with gas (this would compare with $5 per ton coal). However, Siebens use gas only in summer when off-peak gas rates are available.

The boilers were originally hand-fired, but a sizeable saving was effected by installing stokers. Hand-firing did not offer the flexibility needed for variable loads resulting from process and power demands. In addition, boiler pressure variation had considerable effect on the operation of the engines driving the refrigeration compressors. Another bad feature of hand-firing was the inability to maintain furnace temperatures high enough for good combustion when the only load was refrigeration.

Underfeed stokers made it possible to operate at almost ideal conditions under all operating loads. Boiler pressure was maintained constant, and an annual fuel saving of 40 percent was realized. There were two drawbacks to this type of stoker, though. It required a good grade of bitunimous coal having a high ash-fusion temperature to prevent clinker formation and excessive tuyere maintenance.

Later on, spreader type stokers were installed. Both were made by the American Coal Burner Co. but while a conventional installation was made in the Combustion Engineering NuWay HRT boiler, a special adaptation was made in the Kroeschell HRT boiler.

These stokers convey coal from the hopper by means of slow moving cast steel screws. The coal is discharged into an air stream emerging from under each screw. The larger pieces fall near the front, and the small pieces are blown further back. The fines and duff burn in suspension. This assures a thin, even fuel-bed without clinker formation. The spread is adjustable by varying the air velocity to suit the type of fuel being burned.

An air-tight brick dividing wall was built from the floor of the wind-box to the grate level in the Kroeschell boiler. This 9 in. refractory wall makes it possible to operate half the grate area independently of the rest. The air duct from the fan was built into the bridge-wall to admit air into each of the two sections.

Initial tests showed that half the grate area was sufficient to carry the full boiler rating. Further tests indicated that 30 percent of the grate area could be bricked up and still maintain the full capacity of the boiler. This was done with the result that burning rates as high as 90 lb. per sq. ft. were frequently realized. Monthly equivalent evaporation averaged 8.3 lb. of steam per lb. of coal, burning Northern Illinois coal having a heat content of about 11,200 Btu per lb.

The wide variation of fuel that can be burned with this equipment has made it possible to reduce fuel costs 35 percent in addition to the 40 percent already mentioned. Liberal furnace volume coupled with the fact that nearly balanced draft conditions are maintained, reduces gas velocity to such a low rate that there is no fly-ash deposition beyond the boiler setting. Full advantage can thus be taken of market conditions in the purchase of coal. For example, yard-screenings having over 90 percent duff can be burned successfully.

The steam main from the powerhouse to the brewery is an 8 in. header with a 4 in. run-out to the Corliss engine, and a 3½ in. line to the Troy Engberg. Steam exhausts to atmosphere through a relief valve set at ½ lb. back pressure.

(Continued on page 56)

This compact unit carries most of the plant refrigeration load. Troy-Engberg steam engine drives Wolf Linde ammonia compressor.

LUBRICATING OILS FOR COMPRESSORS

Operating conditions of refrigerating compressors vary widely, from low to medium temperatures and to meet these conditions specific lubricating oils are being refined.

A. F. BREWER (Member A.S.R.E.)
Technical and Research Division
The Texas Company, 135 E. 42nd St., New York 17, N. Y.

LUBRICATING oils for refrigeration compressors are specialty products, refined specifically to meet the operating conditions prevailing in refrigeration service. These conditions may vary widely. The refrigerant low temperature range may be from around plus 35 F to well below —100 F. The maximum high side temperature may go as high as 350 F at the same time cooling water may vary according to locality. The possibility of moist air leakage may be a factor tending to reduce the dielectric strength of the oil.

To meet these conditions, petroleum lubricating oils are refined to certain viscosity ranges (according to the conditions set forth in the following table. This is the first and basic requirement — viscosity. It is not a quality indicator, however, simply an indication of that physical property, relative fluidity.

Quality is indicated by the resistance to wax particles "plating out" on expansion valves, and the low moisture content. The former is noted by the floc temperature, the latter by the dielectric strength. A floc test of —60 F or below and a dielectric strength of 25,000 volts or better

The purpose of this article is to bring out the fact that refrigeration machinery must be lubricated effectively if it is to operate economically. This fact is realized by the builders of refrigeration compressors, their service people, the operators and the petroleum industry. The degree of cooperation which prevails among these groups in their approach to the solution of the ultra-low temperature requirements which are becoming more and more exacting today, is a highlight in industrial progress.

are indicative of a well-refined refrigeration grade oil. All other tests, even for pour and cloud are more or less secondary and will fall in line with the viscosity range according to the base or crude stock involved.

The Floc Test

Cold exerts a markedly different effect upon petroleum lubricating oils, than it does upon simple fluids such as water. Simple fluids of this nature have fixed and accurately ascertainable freezing points at which a complete change from the liquid to the solid phase takes place. Petroleum oils, however, being complex mixtures of hydro-carbons of various melting or freezing points, behave like solutions and frequently precipitate some portion of their hydrocarbon constituents before the whole mixture solidifies. This explains the wax haze and floc which are observed when such oils are chilled to very low temperatures.

The cloud and pour tests, forerunner of the haze and floc tests, sufficed when petroleum lubricating oils were to be used for normal ice-making or cold storage refrigeration, but for lower than average service when capillary tube expansion valves are used, cloud and pour tests are only roughly indicative of how the oil will behave at temperatures 30 to 40 or more degrees below the temperatures at which cloud may form and the oil ceases to pour. When an oil has been refined or processed so as to remove or change the structure of its wax content, dependable performance is more nearly assured regardless of its observed pour test. The floc test was designed to measure quantitatively this wax content. In effect, it is a wax precipitation test. It is made on

Extract from January 1951 issue of "Lubrication."

REFRIGERATION COMPRESSOR—SERVICE CHART

Service	Evaporator Temperature (Low Range) F.	Type of Compressor	Refrigerants Most Widely Used	Compression Ratio	Discharge Line Temperature, F. Observed	Discharge Line Temperature, F. Calculated	Lubricating Oil Viscosity Range Sec. Say. Univ. 100 F.
Ice Cream Hardening and Storage	—20 to —30 F. Hardening 0 F. Storage 25 F. Cooling	Reciprocating	"Freon-12" "Freon-22" Ammonia	From 4 to 10 From 4 to 10 From 7 to 12	 275 300	 325 350	150–200 150–200 150–300
Food or Meat Freezing	—20 to —30 F. room storage —40 to —50 F. refrigeration	Reciprocating	"Freon-12" "Freon-22" Ammonia	From 4 to 8	175 to 200	225 to 350	150–300
	Ditto	Centrifugal	"Freon-12"	4 per stage	125	175	300
Fur Storage	Holding: 35 F. room temp. 10 F. refrigerant Killing: 15 F. room temp. —5 F. refrigerant	Reciprocating	"Freon-12" Ammonia	From 5 to 8	225	300	150–300
Ice Making	16 F. Brine 5 F. Ammonia	Reciprocating	Ammonia	From 4 to 8	250	300 to 350	150–300
Air-Conditioning	30 to 50 F. refrigerant 70 F. room temp.	Reciprocating	"Freon-12" "Freon-22"	From 3 to 5	175	225	300–500
		Centrifugal	"Freon-11"		125	175	300

a 10-90 percent mixture of oil and Freon-12, at gradually reduced temperatures until the first faint haze is observed.

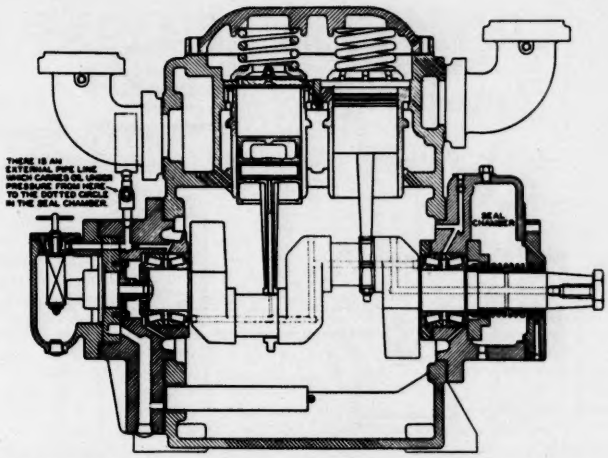
The temperature at which this occurs is recorded as the wax haze temperature. Then the temperature of the mixture is reduced further until the tiny wax crystals forming the haze, gather together in observable flocs. The temperature at which this occurs is recorded as the floc test.

It is important to note that the tiny haze-forming crystals are not in themselves harmful. The warning temperature is that at which these crystals begin to flocculate into clumps. This would indicate that undesirable waxy deposits and clogging might occur in capillary tubing or expansion valves at or below this temperature.

Current Research Activities

Current research in the study of the low temperature characteristics of refrigeration oils is being directed towards duplicating very severe operating conditions. It is generally recognized that laboratory tests at best only give indications of how a lubricant may perform in actual service. Consequently the consumer should use discretion in selecting oils, giving due consideration to the significance of the tests and test limits that are included. If this is not done, oils may be eliminated from consideration that would be entirely satisfactory for the intended application. It is much better to judge the quality of a lubricant by means of actual service tests under controlled conditions rather than solely on the basis of physical tests run in the laboratory.

Reputable oil refiners run continuous manufacturing control tests on all their products to insure the marketing of uniform materials. The tests and test limits adopted for this purpose give assurance that the various refining operations are being conducted satisfactorily and that the end product is of uniform quality. Some of these refinery control tests will not necessarily be correlated so far as actual service performance is concerned and may vary from one oil refiner to another due to the use of different crudes, processing procedures and processing conditions. Water separating tests appear to fall in this category. Moisture content must of necessity be maintained very low in refrigeration systems; hence, results obtained with the conventional water separating tests lose their significance except as possible refining control limits.



Cross-section view of a multi-cylinder Vilter refrigerating compressor.—Courtesy of The Vilter Manufacturing Company.

Laboratory wax precipitation tests may be similarly misleading. Their use, therefore, as a major criterion of quality for refrigerator oils must be approached with caution when interpreting the results obtained due to the inability to correlate them completely with service. As an example, an oil producing a wax haze by such a laboratory test in the neighborhood of -20 F had given satisfactory service for a number of years in actual systems equipped with oil separators and operating at temperatures of some 50-60 F lower. Use of the oil separator apparently reduced the concentration of oil circulating with the refrigerant to such an extent that very little if any wax was precipitated even at these very low temperatures.

In another instance difficulty was encountered with a Freon 12 system operating at -60 F which could not be eliminated by using a specially prepared oil showing a wax haze of -75 F in the laboratory test. It was found that the difficulty being experienced was actually due to "oil logging" of the evaporator coil rather than to any wax plugging. By special processing, an oil was prepared with a wax haze of only -40 F, as measured by the laboratory test, yet it gave satisfactory performance at -60 F even after an extended period of operation.

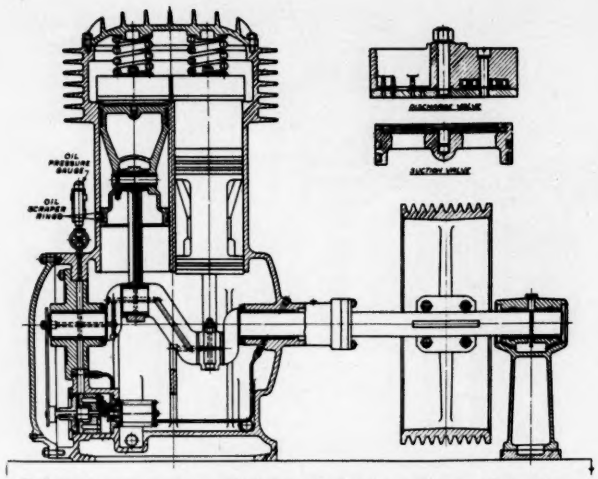
The Detriment of Water

When a refrigeration grade oil comes in contact with certain types of refrigerants, any moisture present will tend to accelerate corrosion, promote the formation of detrimental deposits or, even enter directly into chemical reaction under certain conditions of pressure and temperature. Hence the adoption of a high dielectric strength requirement as part of the usual purchasing specification for refrigeration oils. An appreciable amount of water in any such system might also cause stoppage of the expansion valve due to freezing; ice formations in the cooling coils would also be a possibility, an occurrence which would reduce evaporative efficiency.

Moisture in refrigerating compressor service will be most likely to cause corrosion when sulfur dioxide is being used. Sludge or objectionable deposits may in turn be experienced with ammonia, methyl chloride, Carrene and the "Freon" group in the presence of excess moisture.

The initial charges of such refrigerants and oil, therefore, must be virtually water-free, and care must be taken to prevent the occurrence of leaks which might lead to entry of moisture-laden air and subsequent condensation of moisture. All this, of course, becomes a function of the manufacturer in the original design and construction of the unit and the service man in its maintenance. In turn, it becomes the function of the manufacturers of the refrigerants and lubricating oil to prepare their products so that these will also be as dry as possible.

Where water cannot be entirely removed, it may be necessary to use a desiccant or to add a small amount



Lubrication system for a Frick 2 cylinder Freon-12 vertical reciprocating compressor. Oil enters the gear pump through the combs of the filter. The pump is driven by a chain and sprockets from the crankshaft. The main flow of oil goes upward to the outer bearing, above which a branch leads to the pressure gauge and relief valve for regulating the pressure. Opposite the chain a branch is taken off to the inner bearing and shaft seal. The rings on the lower part of the piston are of the oil scraper type, with ports behind them for draining the oil back into the crankcase—Courtesy of Frick Co.

of anhydrous methyl alcohol as an anti-freeze. Alcohol, however, can best be regarded as a remedy, not a cure. Furthermore, most alcohols are not anhydrous, so careless action on the part of a service man may lead to introduction of sufficient water with the alcohol to subsequently cause serious deposits to develop. The presence of alcohol, even in its purest form, may also be objectionable as it adds another chemical to the already complex assortment which is presented by the refrigerant, the lubricating oil and the usual metals employed in the system.

Dielectric Strength

Moisture content in petroleum lubricating oils became of consequence with the development of the electric transformer, and the use of light viscosity lubricating oils for insulating and cooling purposes. Obviously, such oils had to show maximum insulating qualities; water would reduce these materially. The test developed was of an electrical nature. It determines the absence of water by the resistance offered to passage of electric current. Petroleum oils are excellent non-conductors of electricity when virtually free from entrained moisture; under such conditions only a negligible amount of current can pass. So the test procedure involves subjecting the oil under consideration to high voltage in a standardized test cup fitted with fixed gap electrodes of copper or brass. Resistance of oils to a stress of at least 21,000 volts per millimeter was found to be an indication that they were sufficiently dry for transformer purposes.

With the advent of methods of refrigeration requiring oils of like dryness, this test for dielectric strength (to a minimum of 25,000 volts) became of equal value to the petroleum chemist in refining and treating his lubricants for compressor service. Minute traces of moisture or solid materials have a very definite effect on reducing the dielectric value of an oil. In refinery procedure the presence of any of these materials is virtually eliminated by filtration. A variety of materials can be used for filtration. Filter press methods have proved to be most dependable, using a special grade of filterpaper for moisture absorption.

Care in Handling to Prevent Moisture Absorption

Petroleum oils which have been actively dehydrated will tend to reabsorb a certain amount of moisture when exposed to the air for any length of time. This will result in reduction of their dielectric strength, dependent upon the relative humidity of the air, the temperature range and the length of time they have been so exposed. They should, therefore, be carefully stored and the containers opened only when it is necessary to use the oil; subsequently, if any oil remains unused the containers should be sealed as tightly as possible using special airtight replaceable tops when cans are involved, or sealing gaskets on metal drums.

Before usage it is always advisable to keep containers of oil at room temperature, or the temperature of handling, for at least twenty-four hours. This will assure of an equalized temperature, and will reduce the possibility of moisture condensation in the oil and impairment of its dielectric strength. It, of course, is practicable to bring back the dielectric strength by refiltration through specially dried blotting paper but this is a costly procedure and it should not be necessary if the oil is properly handled.

Mechanical Refrigerated Trucks Show Gain

RECENT developments in mechanically refrigerated motor trucks will play an increasingly vital role in the distribution of perishable foods, the Society of Automotive Engineers was told at its annual meeting in the Hotel Book-Cadillac, Detroit, Mich.

W. E. Petersen, of International Harvester Co., said that new equipment and methods have so drastically reduced the loss of perishable foods in transit that the progress actually represents an increase in the nation's food supply.

V. M. Drew, of Fruehauf Trailer Co., warned that more engineering attention should be directed toward proper insulation of truck bodies to meet demands for refrigeration particularly on long hauls requiring the vehicle to enter various extremes in temperature with the same cargo. The chief objective, he explained, is not extreme cold, but the maintenance of a safe and satisfactory differential in temperature between that inside and that outside the carrier.

Fibrous insulating materials are growing in favor, he added, recommending that, even if truck walls are insulated, the outside should be painted in light colors, or coated with stainless steel or aluminum, to reflect heat rays.

WATCH TAX EXPENSE ALL YEAR

Taxes have increased tremendously the past decade, and are destined to go still higher, which makes it necessary to keep this expense item up-to-date the year round.

ARTHUR ROBERTS

TAXES are bound to rise, nobody knows how high. This puts an added burden upon the small business man who, not only may have to be satisfied with less profit after taxes from now on, but he will also have to step up his managerial technique in order to come through this wartime economy in the black. How much he can bank out of gross income depends upon his ability to manage his business and the way he records and watches his operating expenses.

One expense that is not watched closely enough throughout the year, an expense that has grown tremendously during the past decade, and is destined to go still higher, is tax expense. Most men resign themselves to paying the tax and consider it only around filing time, which was all right in the days before Pearl Harbor when the rates were much lower and the tax expense at that time did not influence operations to a great extent, but now the skyhigh toll has scrapped old yardsticks, it has changed ratios that once were considered normal and complicated managerial procedure, so that it now becomes necessary to consider the tax on income throughout the year the same as rent, mortgage interest, depreciation and payroll. Tax is as much a current charge against profits as any item under overhead. If the reader does not put tax expense in the same category with other business outlay, he may find it difficult to do business at a profit even though all his operating elements are what normally would be considered satisfactory.

How many of you have thought about tax expense in this way? Not many, if our public accounting experience in this field is any criterion.

Tax Touches All Items Of Business Operations

Today, the tax touches every element of business operation, sales, credits, collections, costs, working capital, profit and loss statement analysis, budgeting, etc., hence every phase of operation throughout the year must be analyzed in relation to the Federal levy on income, otherwise, the taxpayer may find it hard to do business at a profit even though his operating efficiency would normally be considered satisfactory.

Formerly, the yardstick of managerial efficiency was reflected in the net profit and then the income tax was deducted. The net profit was the thing. If it showed a satisfactory return on investment and the ratio to sales was at least passable, the management considered that it had done

Rising taxes will put an added burden on all business; and to anticipate and prepare for this increased expense is good managerial procedure, necessary if adequate margin of profit is to be maintained. Throughout the entire year, all operations in relation to tax rates should be watched and kept up-to-date.

a good managerial job. It could figure on crediting a substantial part of the net profit to surplus or to net worth because the tax in the days before Pearl Harbor took only a modest portion. Now it cuts so deeply into earnings that a businessman can no longer place as much reliance in the net profit as a yardstick of efficiency because, after the income tax is deducted, the net will be substantially reduced. "Taxable profit" would be a better term for the difference between sales and over-all costs. The net profit is really what is left after the Federal tax is deducted.

And even if a satisfactory portion is left after deduction of income taxes, there may not be funds to pay unless the liquid working capital is increased by keeping costs under rigid control and refraining from excessive investments in fixed assets. The way to assure taxable liquidity is to charge the tax up monthly so that it is currently recorded as an accrued liability and taken into consideration when the current ratio is checked to find out what the working capital position is. The difference between the current assets and the current liabilities is the working capital, but the calculation will be misleading unless the tax due to date is included with the current liabilities.

For a time there was hope of tax relief. Congress decreed certain reductions and there was hope for further cuts. But as the picture looks today, we are going to pay high taxes for a long time and the wise businessman will bow to the inevitable and "beat the rap" by increasing his business efficiency. He has no alternative. If he is not ever alert to effect economies, he will have a hard time keeping working capital at a point where it will cover his current obligations and his income tax payments. Remember that the net profit shown on the profit and loss statement does not indicate the liquid funds available to meet obligations. We have known cases where the net was quite substantial but the working capital was way below par.

Include Tax in Budget

When budgeting operations for a forthcoming year, it will be necessary to estimate the tax in order to pre-judge how profitable sales volume will be. Many taxpayers enter the tax when paid, quarterly or annually, as a charge against surplus or net worth, because the Federal tax cannot be deducted from income on the tax return. From the income tax standpoint, this is Okeh, but from the standpoint of business analysis, it beclouds perspective.

The tax should be pro-rated currently to determine spendable income for the period. If not prorated, it is impossible to get the proper perspective on current operations and it is preferable to analyze results monthly to supervise the business with maximum efficiency. Serious losses or irregularities may result if you depend upon semi-annual or annual checkovers to determine the why of losses or gains, yet, many cling to long-term analyses of profit and loss figures with an utter disregard for the consequences.

The reader is concerned, in the final analysis, with the spendable or

pocket-profit, because that is what he can bank after the income tax is paid, therefore, he should figure on that objective, no other, when budgeting or analyzing the results of operations. If this figure is unsatisfactory, he must work back from there and take corrective action. Procedure will depend upon circumstances and differs with the business, hence, we cannot offer specific counsel or suggestions. Our purpose in this article is mainly to impress upon the reader the need for revising his viewpoint and method of handling tax expense because, from now on, it will be a major outlay, and like the main gear in a machine, it will influence every element of operation.

Credit men, in view of the heavy taxation that will bear down on business men from now on, have decided to revise their method of credit analysis. In the future, when granting credit, the credit man and banker will consider the tax to be paid on business operations, in order to determine the actual earning power of the credit-seeker's business, a factor that did not inject into credit analysis in the days before Pearl Harbor. Inasmuch as business specialists have now decided to consider high taxation a permanent fixed expense in business operation, the business man should also get in line and appraise his credit risks the same way.

At one time, if profits were limited, the taxpayer could increase prices, or sales volume, and "up" his net in this way, but the progressive features written into income taxation now, and which will probably be more pronounced at time goes on, minimize the return on increased volume. In fact, if the increase puts the taxpayer just over the borderline to a higher tax bracket, he may earn no more or even less than he did when prices or dollar volume was lower. Then too, costs are sure to rise with increased taxation because the toll finds its way indirectly into selling prices.

Higher Costs and Wages Bring "Profit-Squeeze"

Higher costs will bring demands for higher wages and this puts the "profit-squeeze" on the taxpayer who must maintain prices at a specific level because of price controls or competitive factors. During the last war, certain lines were exempt from price control, but this time, if price control is enacted, it may go right across the board. With higher costs, higher taxes and price control on the agenda, every business man will be on his mettle to keep in the black.

There are numerous ways of keeping an eye on tax expense during the year, too many for us to discuss here. It may pay to bring in a tax counselor quarterly instead of annually to get advice along these lines. Or, if the bookkeeper has a knowledge of tax, to consult him frequently throughout the year about the tax trend in relation to his operations or to get advice from him before he takes certain action that may affect tax expense in one way or another.

In the past, it has been usual to start grappling with the mathematics of a return around filing time, but when filing time comes around, it is hardly likely that all that happened will be remembered during the prior taxable year and even if it is, nothing can be done about changing the record. The reader should base his return on his records, and if he has not taken the proper precautions throughout the year to keep his tax expense at minimum, he will find himself short on "take-home" profit from now on.

If a transaction has been handled in a certain way, it must be so recorded; if certain obligations have not been settled, they cannot be deducted; if inventory has been figured too high, there is little the taxpayer can do about it when the year has passed into history. The way to effect maximum tax savings is to watch tax expense monthly along with other expenses.

Moreover, every transaction should be considered in relation to the tax. For example, if a taxpayer owes $2,000 at the end of the year and files on a cash basis, he should figure how much tax he will save if he pays these bills at once instead of carrying them over to the next year. If he lacks the money to pay, he should figure out what it will cost him to borrow the money, compare this cost with the tax savings, and if it is profitable, borrow and pay the bills to get the tax deduction.

If he contemplates an advertising campaign, he should deduct the tax from its cost to determine the net cost of the publicity to him. In some cases, this will enable the taxpayer to increase his advertising outlay over similar expenditures in lower-tax periods. Repairs and other outlays should be considered in the same light. Their cost will be reduced by the amount of the tax.

Modernization cuts tax expense also. One cannot deduct this outlay as an expense. It's an asset. But, the depreciation that may be taken on the investment is deductible, and so, the tax saving is effected indirectly. Replacements are in a similar category. If old equipment has been written off and replaced with new, the taxpayer can start taking depreciation again on the new units and effect a tax saving that reduces the investment. These comments illustrate what we mean when we advise the reader to watch tax expense all year round in order to appraise its effect on all elements of operation. There are so many different ways in which the tax affects operation that we cannot cover them in this limited space. But we have told enough to give an inkling into the procedure.

Tax is now a permanent major expense, it will increase rather than decrease, and it must be kept in mind throughout the year. The taxpayer must study and analyze all operations in relation to the tax rates and regulations, not at filing time only, but throughout the entire year, otherwise, he may earn little or no profit in the hectic period ahead, regardless of how well he may manage his business.

Court Upholds Price Cut To Meet Competition

THE United States Supreme Court recently upheld the seller's right to reduce his prices to meet those of a competitor, even if competition is lessened in doing so. In a case involving the Standard Oil Co. of Indiana, the high court reversed a circuit court decision in a Federal Trade Commission suit against the firm.

The FTC charged Standard Oil with illegally discriminating in favor of certain customers in pricing its products. Standard Oil replied that it reduced its prices to meet a competitor's equally low price. This was the company's only defense. The Supreme Court decision was made on a five to three vote and the majority opinion said, in part:

"We may conclude that Congress meant to permit the natural consequences to follow the seller's action in meeting in good faith a lawful and equally low price of its competitor . . . The heart of our national economic policy long has been faith in the value of competition."

The opinion pointed out that there has been widespread understanding that under the Robinson-Patman Act, the seller need only prove that his price reduction had been made in good faith to meet a lawful and equally low price of a competitor to have a complete defense against a charge of price discrimination.

THE ICE INDUSTRY

NATIONAL ASSOCIATION OF ICE INDUSTRIES

Executive Offices
1706 L St. N. W., Washington, D.C.

Executive Secretary
Mount Taylor, Washington, D.C.

President
H. O. McLain, Chicago, Ill.

First Vice-president
E. F. Condon, Los Angeles, Calif.

Second Vice-president
Wm. J. Ayers, Memphis, Tenn.

Treasurer
Geo. Steers, Jr., Kalamazoo, Mich.

THIS MONTH IN BRIEF

Party Ice which offers the most prominent market for ice will be the basis of the 1951 national ice advertising campaign in consumer magazines. Forty-four magazine advertisements in black and white and four-color have been scheduled, in addition to an adequate schedule of trade paper advertising.

A nation-wide survey on the use of trucks in the ice industry has just been completed by ICE AND REFRIGERATION. Number of trucks in service, rate of replacements, advantage of special body types for ice delivery, are some of the points brought out in the survey.

The thirty-first annual convention of the California Association presented a program of up-to-date information on subjects of current interest to ice men everywhere. The ice merchandising forum held the second day covered vending machine sales, selling ice punch bowls, party and specialty ice, poultry icing and other subjects.

A joint convention of the Missouri and Kansas Ice associations was held at Kansas City, Mo., January 8-10. A session of the merchandising forum covered vending machine operation and other subjects of current interest.

Party Ice Basis of Consumer Advertising In 1951 Public Relations Program

PARTY Ice—most promising market for ice the country over will be the keynote of the 1951 national advertising campaign in consumer magazines.

Although the project for the coming year's campaign is smaller than last year, about 44 magazine insertions will be made as compared to only ten in 1950. This will be accomplished through the use of smaller ads run in black and white instead of page-size color ads. Three four-color, full-page ads are at present scheduled, one each in Life, The Saturday Evening Post and Esquire.

The campaign will be divided into two series, both promoting the purchase of extra ice for parties, picnics and other special occasions. One series will feature a memo sheet torn from a pad, bearing the handwritten message, "Don't forget to get Ice for . . . " (Mention of a party or picnic will be filled in). These ads capitalize on the known fact that in most cases it is the man of the family who stops for ice on his way home from the office. The memo pad gives the ad an interesting informal aspect.

The other series of consumer ads will show a single comic cartoon with the title "Why Was I Born?" each depicting an embarrassing situation that could develop should a host run short of ice.

These main campaigns are scheduled for next spring and summer in Life, the Saturday Evening Post, Time, Woman's Home Companion, McCall's, and Better Homes & Gardens. In addition, space will be taken 12 times in the Nancy Sasser homemaking column, six times each in the Ladies Home Journal and Good Housekeeping. The two "Holiday Ice" advertisements which have each already appeared in Life and the Saturday Evening Post tentatively complete the schedule.

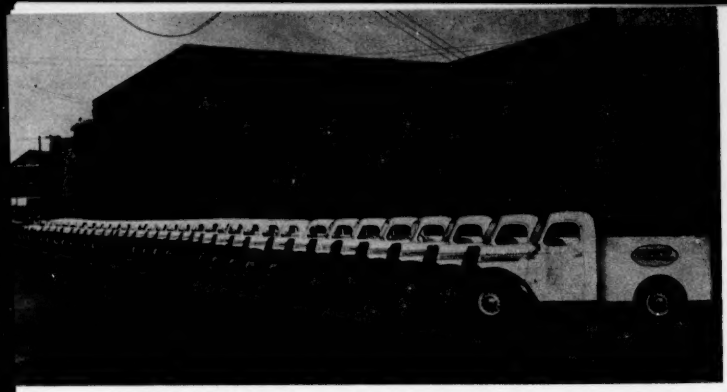
There is a difference in ICE!
The Ice your Ice company makes is...
* Solid & Hard-Frozen
(NO half-frozen shells or "slush")
* Slow-Melting
(Your customers DON'T like ice that quickly disappears)
* Pure & Taste-Free
(Does NOT give an "off" taste)
* Crystal-Clear...
(IMPROVES the appearance of the beverage)
* And It Costs Less!
Compare that kind of ice with any other ice you ever saw!

One of the trade paper advertisements to appear in American Restaurant, Beverage Bulletin, Chain Store Age, Club Management, Fountain Service, Hotel Bulletin, Hotel Management, Hotel Monthly, International Steward, Liquor Store & Dispenser and Restaurant Management.

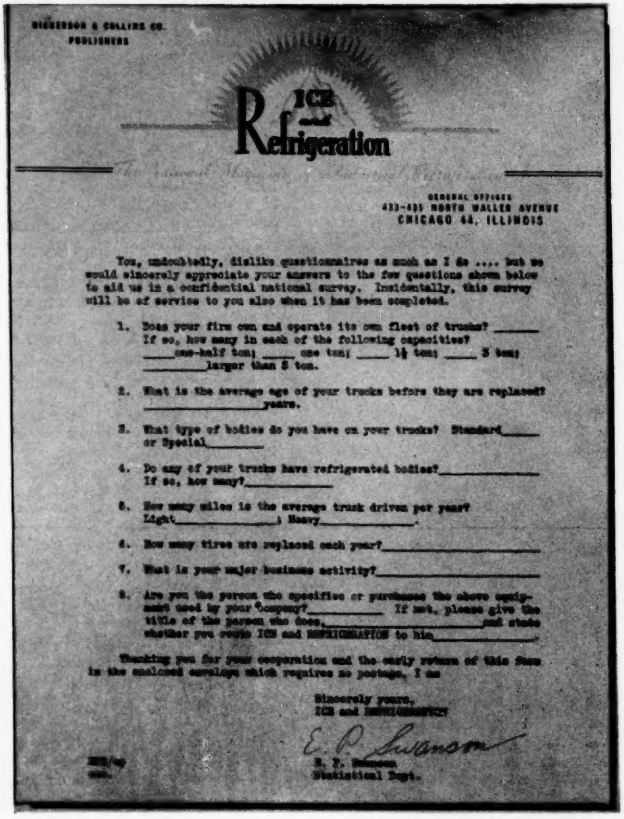
Holiday Ice Advertised in Popular Magazines

A BOLD-FACE, eye-catching advertisement to boost party ice sales appeared in the December 18 issue of Life magazine and in the December 23 issue of The Saturday Evening Post. It was timed to reach the public at the advent of the holiday season. Through these two publications it reached a combined circulation of over 9,400,000 readers.

This



Ice delivery truck fleets such as the one shown here are common in any medium sized city in the United States. This fleet of 34 International Delivery Trucks serves a city of 290,000 people. The owner is only one of fourteen ice companies listed in the city.



DICKERSON & COLLINS CO.
PUBLISHERS

ICE and Refrigeration

GENERAL OFFICES
433-435 NORTH WALLED AVENUE
CHICAGO 44, ILLINOIS

You, undoubtedly, dislike questionnaires as much as I do .... but we would sincerely appreciate your answers to the few questions shown below to aid us in a confidential national survey. Incidentally, this survey will be of service to you also when it has been completed.

1. Does your firm own and operate its own fleet of trucks? _____ If so, how many in each of the following capacities? _____one-half ton; _____ one ton; _____ 1½ tons; _____ 3 tons; _____larger than 3 ton.
2. What is the average age of your trucks before they are replaced? _____years.
3. What type of bodies do you have on your trucks? Standard_____ or Special_____
4. Do any of your trucks have refrigerated bodies?_____ If so, how many?_____
5. How many miles is the average truck driven per year? Light_____; Heavy_____.
6. How many tires are replaced each year?_____
7. What is your major business activity?_____
8. Are you the person who specifies or purchases the above equipment used by your company?_____ If not, please give the title of the person who does,_____and state whether you route ICE and REFRIGERATION to him_____.

Thanking you for your cooperation and the early return of this form in the enclosed envelope which requires no postage, I am

Sincerely yours,
ICE and REFRIGERATION

E. P. Swanson
E. P. Swanson
Statistical Dept.

This survey form was mailed to one thousand ice manufacturers in every state without selection as to the size of the company or the amount of ice produced. Replies represent a fair report from which industry-wide figures are projected for this report.

ICE and milk. The last two food commodities still being delivered to the door of the consumer. Because of the sharp rise in wages and the over 100 percent increase in the price of trucks since 1944, this delivery problem is far more acute than it was in 1944 when the National Association of Ice Industries showed that 6.5 percent of every sales dollar was used for delivery. This amount was exclusive of labor which represented 48.3 percent of every dollar for the entire plant operation.

At today's costs and salary expense, the annual cost of delivery in the ice industry is well over the $57,378,000 costs of 1944. This condition existing in many other fields brought about the modern methods of distribution and has bypassed the heavy overhead and educated people in the cash and carry system.

Some very startling figures have been revealed as a result of the survey. Among these are: (1) A ton of ice requires an average of 21.7 truck miles to make the delivery. (2) Over 60,000,000 gallons of gasoline are required annually to keep these trucks rolling. (3) Forty out of fifty readers of I. & R. in the ice industry are directly responsible for the purchasing of capital equipment. (4) The survey was mailed to 1000 ice manfacturers without selection as to size but only to ice manufacturers ranging from one truck operation to the largest maintaining a fleet of 970 trucks. (5) Annual mileage on trucks ranged from 2,000 miles to 70,000 miles each. (6) The 245 replies received were from 46 of the 48 states with no reply from New Hampshire and North Dakota.

Number of Plants

Authentic figures on the total number of plants producing ice for resale are not available but sources close to the ice industry estimate between 7,000 and 7,500. As the figures

TABLE I.

MAJOR BUSINESS ACTIVITIES OF RESPONDENTS

Ice Manufacturing & Delivery	126
Ice Mfg. and Cold Storage	10
Ice Mfg. and Locker Plant	3
Ice Mfg. and Retail Fuel	44
Ice Mfg. and Miscellaneous	31
Car and Truck Icing	8
Cold Storage	1
Question not answered	22
Total Replies	245

Business of Ice Delivery

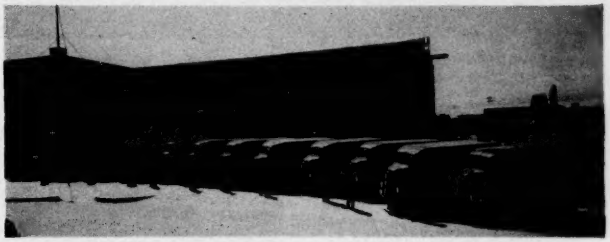
I. & R. reports on the trucks used in the Ice Industry; covering size, age, mileage, tires purchased, etc. This nation-wide survey also reveals that about 84 percent of all ice manufacturers have delivery service.

presented here are intended to be conservatively reliable, the totals projected will be on the basis of the still more conservative figure of 6,800 plants as given by the National Association of Ice Industries "Facts About the Ice Industry" (1945). These 6,800 plants are located in 6,000 towns or cities throughout the United States.

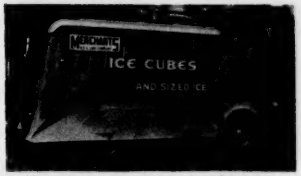
Of the 245 respondents, 233 listed their major business activities covering the allied businesses that ice manufacturers have operated for many years. Of these, the most important is fuel. Forty-four indicated fuel on a par with ice. Others listed cold storage, lockers, car and truck icing, and miscellaneous side lines. The summary of all reports is given in Table I.

A tabulation of the replies was made giving the total from each state, the number of firms owning trucks, and the number of trucks each firm listed for ice delivery purposes. This data is shown in Table 2.

The number of trucks reported by ice manufacturers making delivery totalled 3,666. Of the total returns, 209 companies indicated the number of trucks owned. On this basis, the average fleet is slightly in excess of 17 trucks. By far the most suitable size is the 1½ ton chassis which accounted for 2,077 of the total. The one ton being next with a total of 677, and the one-half and three-



The M. J. Uline Company not only manufactures and delivers ice but also is engaged in manufacturing Cubing, Scoring, and Crushing machines for the industry.



Sixty-five percent of all trucks used in ice delivery have special bodies.

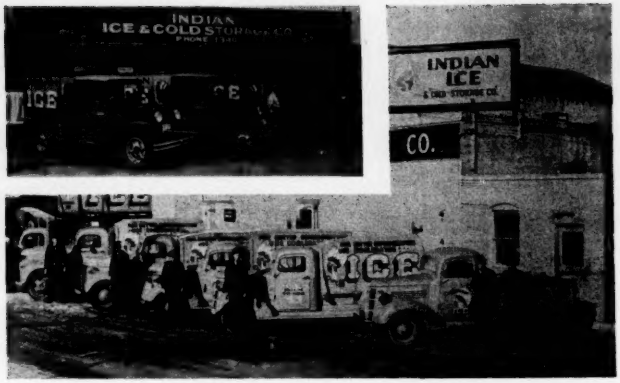
TABLE II.

REPLIES BY STATES AND NUMBER OF FIRMS USING TRUCKS

States	No. Replies	Using Trucks	Total Trucks
Alabama	6	6	116
Arizona	2	6	12
Arkansas	4	3	52
California	14	13	114
Colorado	7	7	52
Connecticut	3	2	18
Delaware	1	1	6
Florida	6	6	71
Georgia	2	1	25
Idaho	3	3	19
Illinois	10	9	1206
Indiana	10	8	116
Iowa	4	4	39
Kansas	6	2	25
Kentucky	8	7	44
Louisiana	8	6	49
Maine	3	3	19
Maryland	5	5	42
Massachusetts	7	5	80
Michigan	2	1	23
Minnesota	1	1	17
Mississippi	5	5	73
Missouri	16	14	202
Montana	1	1	13
Nebraska	1	1	4
Nevada	1	1	5
New Jersey	3	2	17
New Mexico	1	1	6
New York	9	7	75
N. Carolina	11	11	357
Ohio	18	16	212
Oklahoma	4	4	18
Oregon	2	1	3
Pennsylvania	11	7	66
Rhode Island	1	0	
S. Carolina	9	8	101
S. Dakota	2	2	10
Tennessee	7	7	152
Texas	9	8	65
Utah	1	1	21
Vermont	1	0	
Virginia	5	5	45
Washington	3	2	14
W. Virginia	3	2	22
Wisconsin	5	4	40
Wyoming	1	0	

Industry-Wide Figures

Number of manufacturers delivering ice	5,700
Number of trucks in service	88,400
Total number of miles driven per year	900,334,000
Average mileage per tire	26,436
Number of tires purchased per year	139,740
Average annual truck mileage—	
Light duty (1½ tons and under)	11,466
Heavy duty (2 tons and over)	13,044
Average truck service life (years)	6.08
Tons of ice produced (1949 figure)	41,342,458
Average distance each ton of ice is hauled for delivery (in miles)	21.7



Modern delivery methods and accurate cost analysis of each delivery route are two very important factors in profitable ice manufacturing.

quarter ton with 429. All of the larger trucks of 2 tons capacity and up amounted to 313.

Using these average figures as a basis for the total of 5,500 plants operating a delivery service, it is estimated that there are 79,570 trucks under 2 tons and 8,900 trucks 2 tons or over.

Truck Replacement

Of the 88,470 ice delivery trucks, now in service, 13,000 will be replaced after 2 to 3 years service; 46,000 will be replaced after 4 to 6 years and 26,500 will run from 7 to 10 years before replacement. It is significant that the trade-in age varies with the fleet size. Firms operating fleets of 15 to 22 trucks trade them in after an average life of 7.4 years. Fleets of 23 to 35 operate on a 5.4 year average service life. Fleets of 36 to 55 are traded in on the average of 7 years and over 56, the operating life averages 6 years.

On the basis of an average service life of 6.08 years, the ice industry replaces 14,700 trucks each year. As in many other industries where service is a major factor, the net result of fewer working hours and reduced delivery speed, has required an additional investment in rolling stock. More trucks are now in service than ever before and it is likely that each year will show an increase unless curtailment is forced by industry wide controls.

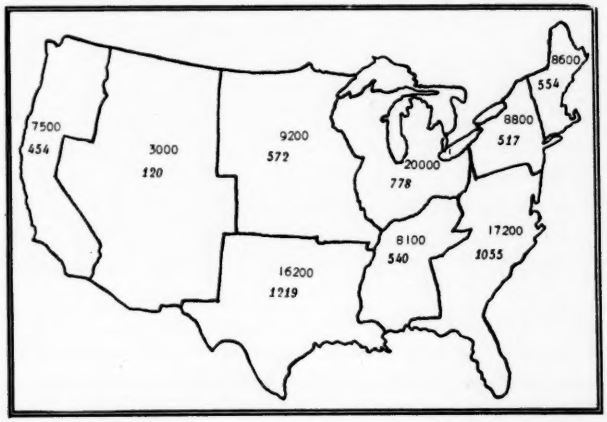
Special Body Types

The ice industry has long been aware of the advantage of special body types for delivery trucks. In addition to the usefulness, there is the advertising value of each truck

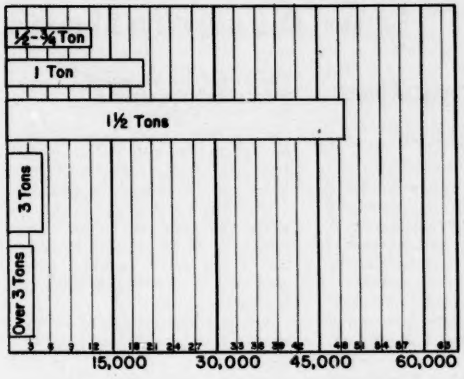
Between three and four thousand trucks of the sizes shown at right are in daily service making deliveries to vending stations, remote distributing points, or railway sidings.

—a moving bill board for the company.

A typical example of how modern transportation improves the service, adds new customers, and reduces delivery costs is shown by the history of the Indian Ice and Cold Storage Company. About 1929, the horse drawn wagons were replaced by the, then snappy two Dodge and one General Motors trucks. According to the owner, labor costs for ice delivery were reduced $1,800 the first year the trucks were used. Further, a total



Leading ice manufacturing plants by geographical location and estimated number of trucks in each. The lower figure (in italics) show the number of plants while the upper figures show the number of trucks projected from averages in each area.



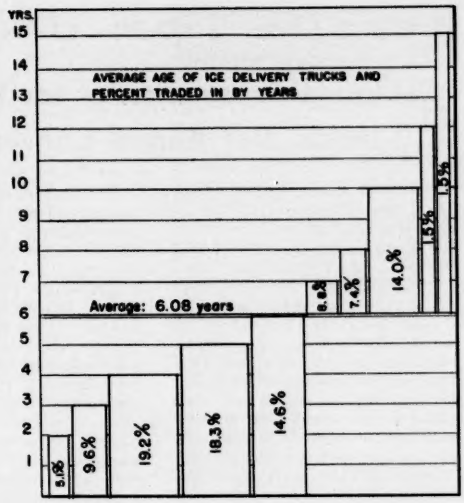


Chart above shows the number of trucks in each size from projected figures. Chart at right shows the percent of trucks in each age group.

reduction in overhead amounted to $4,000.

These first trucks were replaced in 1939 by a fleet of 5 G.M.C. three-quarter ton trucks with streamlined bodies and all attractively painted and identified by the trade mark.

The continuous trend toward better ice merchandising has brought on more sanitary conditions and more eye appeal in the package, the truck, and the handling. Of the 945 replies received, it is revealed that 2,381 trucks have special bodies, 1,008 have bodies furnished by the truck manufacturer, and 74 have bodies built by the owners in their own shops. In addition, a total of 26 refrigerated trucks were listed. The balance of 177 were not indicated as to body style.

Projecting these figures on an industry wide basis, indicates a total of over 51,000 special and 22,000 standard bodies. On the basis of 16 percent replacement (trade-in) per year, there is a market for 8,100 special bodies annually.

Who Answered Survey

Of the companies that own and operate ice delivery trucks, I. & R. reaches the purchaser direct in 83 percent of the cases and 11 percent more are reached by having I. & R. passed on to them.

Thus, 94 percent of the executives to whom I. & R. is made available are keeping abreast of the times as regular readers of ICE AND REFRIGERATION.

Florida Company Operates Fleet of Modern Delivery Trucks

PICTURED above is the plant of the Broadway Ice Co., Tampa, Fla. This plant is owned by Frank Vacanti and his two brothers-in-law. Of the three, Frank is the real ice man. Coming to America with his parents in 1916, he entered school in Tampa, Fla., but three months later left school when the family moved to Denver, Colo. After two years in Denver they returned to Tampa where Frank began as an apprentice in one of Tampa's many cigar factories. Four years later the cigar factory was closed by a strike.

He immediately found employment as an iceman's helper on an ice route. Three months later at the ripe age of 15, he purchased the route and began his career as an iceman. For 20 years, he continued to serve the same route, adding customers as the years continued. In 1940 with the aid of his brothers-in-law, he built the Broadway Ice Co. plant, originally with 17 tons daily capacity. Today the daily capacity is 100 tons, with 300 tons storage capacity. In addition to operating ten company-owned delivery trucks, they serve a number of retail dealers, as well as complete ice service to commercial accounts, also bunker icing for truckers, and snow icing of vegetables.

Reports from Unit Ice Associations

California Association of Ice Industries Holds 31st Annual Convention

THE 31st annual meeting of the California Association of Ice Industries held at the Fairmont Hotel, San Francisco, December 5 and 6 attracted a good attendance. There were approximately 185 registrations which, in view of the number present at other conventions throughout the country, was very good. In addition, some 75 or 80 route men were present at the two sessions on the second day.

The annual banquet, an informal dinner dance, was held Monday evening in the Venetian Room of the Fairmont Hotel, followed by an entertaining floor show.

Of special interest to most ice men was the merchandising forum held the second day. These forums held in California during the year were so successful that the board of directors voted to make them a permanent part of the association's activities.

Opening Session

At the opening session Monday forenoon, Dan Prager representing the National Association of Ice Industries, now with the S & S Vending Machine Co. talked on the "Mid-Century Ice Market. The American economy he said, for many years to come probably will not be a peacetime economy and many concepts of business planning are gone. But this does not mean that there is no longer need for progressive ice management and merchandising. The big job is for ice companies to strengthen their own positions and thereby help to strengthen the free enterprise system. The greatest obstacle to this progress is lack of initiative on the part of top management, he said.

A report on the work and activities of the association during the past year was presented by Jack L. Dawson, executive manager. He spoke particularly of the achievements made in the fields of merchandising and employee training. The merchandising forum had been created through action taken by the board of directors at the last annual convention. Meetings had been held during the year at Los Angeles and Sacramento, with good attendance and programs filled with presentations covering subjects of vital importance to the merchandising field.

More than 70 employees had taken training courses in merchandising. Other activities had consisted of an exhibit at the Los Angeles County Fair and in providing information on legislative and taxation problems.

E. A. Hart of the Southern Counties Ice Co., Los Angeles, gave an interesting and practical talk on meeting competition of small ice-making machines. It is evident he said, that the ice man must tell his story to the customer in a convincing manner before the mechanical salesman arrives. He recommended that the information on this subject prepared by the National Association of Ice Industries be obtained and followed closely.

E. A. Miranda of Reno, Nev., said that if they expected to retain their commercial ice business they would have to use some such material as outlined by Mr. Hart. His company had followed this practice and they had not only counteracted the sale of many ice-making machines but they had also increased their tonnage among their other customers.

W. H. Hunter, Yuba City, Calif., said that personal work by members of his sales force had been able to hold down the sales of small ice makers. Two big customers installed cube ice machines not long ago and stopped using ice altogether, but eventually they returned to the use of ice, using their ice cube machines solely for drinking water in their dining room. The chief factors encountered in counteracting sales, he said, is keeping up the service and keeping in constant contact with the customer.

Hayes Cutler, San Jose, said his company did not merchandise cubes but did sell sized ice and provided customers with a chest for keeping it. An ice chest filed with ice takes care of peak loads over Sundays and holidays and provides trouble-free service at nominal cost.

L. J. Fitzpatrick of the Central California Ice Co., Fresno, said that one big factor in providing good service for sized ice customers is to keep their chests and other containers clean and in good working order. In many instances he said, they had been able to show by comparison that real ice cubes were of much better quality than those made in the mechanical ice cubers.

Use of Ice for Shipping Fruits and Vegetables

J. C. Rear of the Union Ice Co., San Francisco, gave an interesting talk on the market for ice for shipping fruits and vegetables. This, he said, is probably the greatest market for ice in California and Arizona, something like 180,000 carloads of perishable fruits and vegetables having been packed and shipped from that section last year.

A recent development is the location of grower-operated storages on the ranches or close to the packing house or shipping point. These have many advantages to the grower and they have opened up a wide and fertile field for the ice man who supplies ice to these plants. About 53 have been built in California in the last 15 years. These 53 plants represent an investment in excess of 1½ million dollars which shows what these shippers and growers think of ice refrigeration, he said.

An interesting talk on sales relations in marketing was presented by Charles S. Garvin, Pacific Coast retail manager of the Shell Oil Co. Fundamentally, Mr. Garvin said, all business deals with customers and it is their duty to find out what the customers want and then provide the commodities and service they desire. For this reason the salesmen in any organization are probably the most important part of that organization, but one big fault of our business structure is the fact that too many top executives fail to realize and understand the importance of the salesmen's work.

Economic Conditions

A talk on current economic conditions was given by Lloyd Graybiel of the American Trust Company. In California, he said, continuing growth has been going on for several decades, aided by the war industries. Since 1945, three and a half more million people have been added to the population in California, and to house them there had been built about 950,000 houses. This, together with furnishing and equipment, had produced a sizable business boom and industry, in turn, had expanded and some 8100 firms had spent some $1,380,000,000 for new plants and expansions.

M. W. Young of the National Ice & Cold Storage Co., San Francisco, gave a brief summarized report on the National Ice Convention held in

Chicago covering various numbers on the program and brought the California members up-to-date on the most important points of that convention.

Legislative activities and interests of the association were discussed by Jack Hunt. Among the bills of interest to the ice industry which he reviewed was an amendment to the ad valorem tax. Another bill would increase workman's compensation and compensation rates. Others provide for increases in unemployment insurance and proposed truck legislation. Another probable activity of the government in which all business will be interested is the possibility of prices and wages being frozen, he said.

Merchandising Forum

The Tuesday sessions of the convention were given over to the Merchandising Forum under direction of Prof. R. W. Davis, general chairman. Opening the forum, V. V. Ogburn pointed out that the ice industry had created within itself a weakness through the fact that they did not buy and sell enough ice-consuming appliances to make it worthwhile for the appliance manufacturers to continue in business with a full line. In addition, he said, only a very few progressive ice companies are doing a real job of merchandising ice-consuming appliances.

G. W. Scott of The Purity Ice Co., San Jose, talked on vending machines. He explained that his company operates a 25-ton plant for making ice and sells its entire output through ice vending machines. During 1950 he said, each of their ten vendors would have sold something more than 200 tons of ice in block or chunk form, and over 12,000 bags of ice cubes. This figure of 200 tons per unit they feel must be reached to get a fair return. Vendors which do not do this volume of business, he said, should be moved to a better location.

John Mullins of the National Ice Co., Sacramento, said that his company had been operating fifteen leased and five company owned and operated vendors, from which there had been a decrease in sales the past year of about $20,000. All of their vendors with the exception of one, have been selling block ice only. One which has been selling crushed ice and ice cubes since January sold over 110 tons of crushed ice, representing a 33 percent increase in revenue and a 24 percent increase in tonnage. This, Mr. Mullins said, clearly indicated the current trend; that is that people want ice in ready-to-use form.

Charles Pratt of the National Ice Co., Sacramento, told about the business possibilities of providing ice punch bowls or vases to caterers for use at weddings, luncheons, civic and church meetings, hotels, restaurants, night clubs and many other outlets.

R. J. Hoenig of the Southern Division, Union Ice Co., talked on sized ice, party ice and specialty ice. Statistics on his company's business, he said, shows that in the Southern Division 9½ percent of the sales were cubes and 22.6 percent were crushed ice, making a total of some 32 percent of their entire route sales. In the selling of specialty ice, he said they often came up against competition of the mechanical cuber and about the only effective talking point in this connection is the quality of the product.

Mr. Hoenig then discussed the sale of punch bowls and sculptured ice. These provide a good market for ice, he said, and also make for good publicity.

New Uses for Ice

The second part of this panel covered new uses for ice under the heading, "New Fields to Conquer." This was directed by Al Robertson of the Union Ice Co., Hayward.

Ray Mulgrew of the Harry F. Rathjen Co., Oakland, told about his work as sales supervisor of draft beer sales, working with ice companies in the Oakland-San Francisco area. For draft beer, Mr. Mulgrew said, ice refrigeration provides an advantage in its equipment and service and at a price that makes it possible for almost every licensee to sell draft beer. With modern refrigerating equipment, he said, the seller of draft beer can be assured maximum profit, minimum waste, less physical effort and less cash investment.

Larry Fitzpatrick of the Central California Ice Co., Fresno, talked on icing poultry. His company began early this year with a small demonstration unit which they used in retail grocers' food shows with a display of poultry on ice. They had found in this a new market for about 7500 tons of ice sold to the poultry industry in a 200 mile strip in the valley. The tonnage developed had been sufficient to support the addition of 15 retail delivery routes.

R. W. Davis of the Union Ice Co., San Francisco told about promotional work that had been done on the use of crushed ice for displaying fresh meat in meat markets. As a means of bringing to his audience directly the results of this work, Mr. Davis played a wire recorder of an interview with a small grocer on the outskirts of San Francisco. Advantages of using ice, it was brought out in the conversation, were that loss from shrinkage was reduced to nothing, there were no odors around the meat case, no discoloration, no drying out on the surface, and finally that he was not only saving money but was able to provide a better looking product.

Final Session

At the final session Tuesday afternoon, another panel under the Ice Merchandising Forum was conducted, with James M. Reed of San Francisco, as moderator.

Lee Campbell of Swift & Co., talked on poultry merchandising. He said that to be a perfect product, a dressed chicken must be refrigerated with ice. San Francisco, he said, offers an exceptionally good market for introduction of ice for poultry cooling because there are so many dealers who are not yet educated on this use of ice.

W. D. Hadeler, secretary-manager of the California Consumers Association said when ice is used in the produce department of a food store, it not only provides a more attractive commodity but it provides a commodity that is more satisfactory to Mrs. Housewife, one that calls for immediate consumption. For advising members of his association in regard to equipment, Mr. Hadeler said he had plenty of information regarding all types of electric refrigeration, but none at all regarding ice equipment. He also mentioned that at a number of food shows there were many displays of mechanical refrigeration equipment but very little on the use of ice. From his own observation he said that he knew that ice has an advantage for fruits and vegetables and also for poultry and meats, but it is a part of the job of the ice industry, he said, to publicize their product and keep their prospective customers informed about its advantages.

Sil Oliva of the Exposition Fish Grotto on the Fisherman's Wharf, San Francisco, told about his experience in the fruit and vegetable business. Mr. Oliva proved a very entertaining talker, practical phases of his talk covering the large amount of ice in various forms that is consumed by the modern restaurant.

W. F. Asbury, Crystal Ice & Cold

Storage Co., Phoenix, Ariz., gave a talk on the advantages of delivering ice with a dealer-delivery system. One of the advantages, he said, is that it eliminates the cost of truck upkeep. They still, however, retain control of the routes covering the dealers, with compensation insurance and establishing their territories and prices at which they sell. They have regular training meetings which follows the material prepared and produced by the National Association of Ice Industries.

Officers and Directors

Officers and directors for the coming year were elected as follows:

Officers and directors for the coming year were elected as follows:

President, W. F. Asbury, Phoenix, Ariz.

Vice-presidents, Mark A. English, Pasadena; V. V. Ogburn, San Francisco; M. W. Young, San Francisco.

Secretary and Executive Manager, Jack L. Dawson, San Francisco.

Treasurer, R. J. Bailey, San Francisco.

Directors, (Northern Division) Paul Ashley, Fresno; R. J. Bailey, San Francisco; J. L. Gabriel, Hollister; V. V. Ogburn, San Francisco; K. J. Sartori, San Francisco; A. M. Stoker, San Francisco; M. W. Young, San Francisco. (Southern Division), W. F. Asbury, Phoenix, Ariz.; P. W. Easton, Los Angeles; Mark A. English, Pasadena; Philip L. Gabriel, Whittier; G. H. Lampkins, El Centro; Myles McGuire, Los Angeles; J. M. Neagle, Ocean Park; L. D. Sommerville, Long Beach.

Meeting the Issues

The convention was brought to a fitting close with an address by E. F. Condon, first vice-president of the National Association of Ice Industries. The issues to be faced by the ice industry, Mr. Condon said, basically concern costs and sales. One has gone up and the other has gone down rather sharply.

In that respect, he said, the past year has been very bad. They could not avoid the issue of pessimism, and although the attitude of this convention did not reflect it, it was quite evident throughout the entire industry. The discussions and ideas at this convention, he said, if put into effect conscientiously, would go a long way toward reducing this pessimism.

Florida Ice Men Hold Three-Day Short Course On Ice Manufacturing

FLORIDA ice manufacturers finished their second annual three-day short course on the University of Florida campus, in Gainesville, December 13, which featured discussions on the technical side of the industry, good public relations, and day-by-day-operation of ice plants.

Thirty persons attended the course, which was conducted by the General Extension Division of Florida and the College of Engineering of the University of Florida, under the sponsorship of the Florida Ice Association. Instructors from the industry, the College of Engineering, the College of Arts and Sciences, and the College of Business Administration of the University made up the short course faculty.

A discussion of automatic controls in ice plants, led by George Deyo, Minneapolis-Honeywell Co., opened the program. Other topics taken up on the first day included a discussion of heat as related to the manufacture of ice, headed by Newton C. Ebaugh, Ebaugh and Goethe Consulting Engineers, Gainesville; plant housekeeping was the topic of John E. Kiker, University of Florida professor of civil engineering. Mr. Ebaugh also spoke on the behavior of refrigerants.

Plant machinery, its functions and maintenance, was covered in the opening sessions of the second day by Roy Hickman, Community Ice., Wauchula, and B. W. Murray, lubricating engineer, Sinclair Refining Company, Jacksonville. C. T. Baker, Atlanta, Georgia consulting engineer, talked about cooling towers and evaporative condensers during the afternoon session. Safety in the ice plant was explained by Earl P. Martinson, head of the department of Industrial Engineering of the University, in the final session on the second day.

Short course enrolees got together in the evening for a banquet at Gainesville's Club 400. The banquet was highlighted by a skit revealing "case histories" of short course leaders.

The last day of the course included a discussion of public relations, led by Frank Goodwin, College of Business Administration, University of Florida, in which he told manufacturers that good relations with the public involves every employee from the top executive to the individual who performs the most menial chore. It is the responsibility of management to see that each employee maintains a friendly, helpful attitude at all times, Goodwin said.

Two course sessions were headed by A. P. Black, head of the Chemistry Department, at the University. The first session was on water, "raw material of the ice plant"; the second was on the handling and use of brine. F. H. Cramer, chief engineer of Florida operations, City Products Company, Miami, ended the course with a talk on plant maintenance.

E. E. Melton, Florida Ice Association president, Mulberry, expressed thanks for his organization to the University for aiding the ice industry in their educational program. Dean B. C. Riley, General Extension Division, in commenting on the instructional program, expressed the opinion of all when he said the course was of much value to the ice industry.

Florida ice men and instructors taking part in three day short course on ice manufacture at University of Florida

Missouri and Kansas Ice Associations Hold Joint Annual Convention

JOINT annual convention of the Missouri Ice Manufacturers Association and the Kansas Association of Ice Industries was held at the Hotel President, Kansas City Missouri, January 8-9 and 10.

The members of the Missouri Ice Manufacturers Association voted to change the name of the association to Missouri Valley Ice Manufacturers Association.

Officers and Directors, Missouri Valley Ice Manufacturers' Association. Standing: Harry R. Jacobs, director, Salisbury; Richard C. Muckerman, director, St. Louis; B. A. Welscher, director, Poplar Bluff; V. A. Esphorst, secretary-treasurer, St. Louis. Seated: Harold Margolin, vice-president, Kansas City; M. J. Garvey, Jr., director, St. Joseph; J. R. Dean, president, Cape Girardeau; J. E. Campbell, director, Joplin.

J. R. Dean, Pure Ice Co., Cape Girardeau, Mo., was re-elected president; Harold Margolin, Artificial Ice Co. Kansas City, Mo., was re-elected vice-president; and V. A. Esphorst was re-elected secretary-treasurer. Directors re-elected for two-year terms were J. E. Campbell, Miners Ice & Fuel Co., Joplin; Harry R. Jacobs, Salisbury Sanitary Ice & Supply Co., Salisbury; and B. A. Welsher, Home Ice & Fuel Co., Poplar Bluff.

N. E. Van Dyne of Parsons, Kansas, was elected president of the Kansas Association of Ice Industries. He succeeds H. H. Bettis of Pratt, Kansas, who was re-elected a director. E. J. Hund, Beloit, Kansas, was elected vice-president and George W. Hinds, Hutchinson, was elected secretary-treasurer. L. C. Riggin, Topeka, Kansas; Fred Kunkle, Wichita, Kansas; J. S. Todd, Paola, Kansas, and G. A. Brewster, Chanute, Kansas, were elected Directors.

The joint convention was very successful and was well attended. The following talks were given at the convention and were well received:

"Should You Belong to a Trade Association" by Burdette Yeo, secretary - treasurer, Midwestern Retail Coal Association, Kansas City, Mo.; "New Interpretation—The Wage and Hour Law" by W. W. King, Regional Director, Wage Hour and Public Contracts Divisions, U. S. Department of Labor, Kansas City,; "Adjust Your Sights" by C. P. Austin, Director, Research and Engineering Department, National Association of Ice Industries,; "Profits in Ice Vending" by D. A. Prager, Regional Manager, S & S Vending Machine Company, Arlington, Va.; "Optimistic Views" by Richard C. Muckerman, City Products Corp., St. Louis, and "The National Picture" by Guy W. Jacobs, National Association of Ice Industries.

Mr. King discussed exemption from minimum wage and overtime provisions of the Fair Labor Standards Act. To qualify for an exemption as a retail or service establishment, he said, firms must sell goods or services. More than half the sales must be made in the state in which the establishment is located and at least 75 percent of the annual dollar volume of sales must be recognized as retail sales in the particular industry involved.

A Question and Answer period followed Mr. King's talk on the new interpretation of the Wage and Hour Law in which many questions of those in attendance were answered. This session was very interesting and informative to everyone present.

A session of the Merchandising Forum was conducted by J. M. Cunningham, Sedalia. Many items of interest were discussed including vending operation and their uses in various localities. Everyone present participated in the discussion of this particular session.

Miss Edna Hopper, City Products Corp., St. Louis, Mo., gave a demonstration of "The Ice Kitchen" which she conducts in St. Louis for various women's groups.

As usual, the floor show given at the dinner dance was an outstanding one. Everyone in attendance said they enjoyed it very much.

Illinois Association of Ice Industries

WM. D. WRIGHT, Secretary

A MANAGEMENT conference by the Illinois Association of Ice Industries was held at Springfield Friday, January 19. Purpose of the meeting was a review of current and prospective price and wage freezes, prohibitions, uncertainties, and the need for group consultation and discussion by ice company managers. The association is taking this and other means to keep members informed as events and conditions develop.

Changes in ownership are taking place, in some instances of which the purchased plants are being shut down as producers, the machinery offered for sale and ice trucked in from other more economical plants. Price structures are being strengthened to meet inflationary increases in costs, and it is expected that ice prices this year will be the highest in history.

Southwestern Ice Manufacturers' Association

P. A. WEATHERRED, Secy-Counsel

CONVENTIONS of the Southwestern Ice Manufacturers Association are now to be held before, rather than after, each ice season, meaning that we are more interested in where we are going than where we have been, in what lies ahead of us than what lies behind us. So, the next Convention will come in February 1951. The dates: Wednesday, 14 to Friday, February 16. The Place: Hotel Galvez, Galveston, Tex.

The first business session will begin Wednesday afternoon at 1:30 giving ample opportunity for members to arrive in Galveston, complete their registrations, secure room assignments, and get settled before the first session begins.

Wednesday evening, February 14, will be open except for the board of directors' dinner given to past presidents and the separate dinner to be attended by the wives of those men who will attend the board of directors' dinner.

The second business session will come at 10:00 a.m. Thursday morning, February 15 and will adjourn by 1:30 p.m. No business session will be held Thursday afternoon.

A ladies' tea, to be given by the wife of the president, Mrs. Harry M. Park, will be held Thursday afternoon, probably at the Galvez Hotel.

An informal party will be held on Thursday night, probably at the Buccaneer Hotel.

The third and final business session will convene at 10:00 a.m. Friday, and will adjourn at about 1:30 p.m. There will be no business session in the afternoon.

The president's annual cocktail party, dinner, floor show, and dance will be held at the Galvez Friday evening, beginning at about 7:00 p.m. and this will be the final official function of the convvention.

Displays will be in place by no later than noon, Wednesday, February 14.

Company meetings will be arranged, upon request, by the association staff for luncheon and afternoon sessions for either Thursday or Friday.

The business sessions will be devoted to down-to-earth and down-to-date discussions of the practical problems confronting those who are responsible for investments in Texas ice properties. Budgeting problems, opportunities for economy on the one hand, and for holding their own in today's changing ice market, will all come in for discussion by men whose information, experience and success command respect.

Menus and entertainment features will be up to standards long established by the Southwestern Association and, despite spiraling prices, another great business and entertainment program will be presented without increase in the registration fees that have been established over a period of the past several years.

Another year and another season lie ahead of us, and the owner and manager will find in the plans and program for this convention, assistance, information, and encouragement that will orient him for the coming season and for operations under another, but different, national emergency.

In passing, we wish to assure our members that the time of this convention will not be taken up in discussion of the intricacies of government regulations. They will receive information needed by them on these troublesome questions through association releases and through advice and assistance available individually from the association staff.

Ohio Association of Ice Industries

GUY W. JACOBS,
Secretary-Treasurer

THE program for the 33rd annual convention of the Ohio Association of Ice Industries to be held at the Deshler-Wallick Hotel, Columbus, February 25-26 is being prepared in keeping with the times. At a recent meeting of the board of directors, approval was given to President Glass' appointment of the following members as a Program Committee: Stewart A. Muenter, chairman, Smith Coal & Ice Co., Tiffin; Wm. H. Adams, City Products Corp., Dayton; Walter B. Blessman, Serv-Ice Delivery Co., Akron; W. R. Cunningham, City Products Corp., Columbus; Harold J. Rolph, Crystal Ice Co., Ironton.

There will be three business sessions, as usual, two on Monday and one on Tuesday. Thus, members can take in the entire convention by arriving in Columbus on Sunday afternoon and departing two days later. The "Open-house" party will be held Sunday evening, and the annual banquet, including a topnotch floor show, Monday evening.

The combined Ladies' and Men's luncheon on Tuesday will be the closing event. The ladies will have their own special luncheon on Monday, and the men will have theirs served in the meeting room during the intermission between the morning and afternoon sessions.

The business part of the program will be complete in every respect and will cover all pertinent aspects of the ice business in times such as these. The speakers will be leaders in their respective fields of endeavor. Some of the subjects will be covered by panel discussions and ample time will be allowed for audience participation from the floor.

Since the Ohio legislature will be in session at that time, hotel rooms will be at a premium. However, the hotel has promised to take care of all those it can and an advance registration will be necessary to get just the accommodations desired.

The final tabulations in the 1950 Safety Campaign, which came to a close on October 31, have been made and the standings in each of the groups have been determined. The winners were the following:

Group A, plants with 1 to 10 employees — Crescent Ice & Coal Co., Alliance

Group B, plants with 11 to 25 employees—City Products Corp., Toledo

Group C, plants with over 25 employees—ServIce Delivery Co., Akron

The combined accident experience for all reporting companies was about the same as that of last year. The frequency rate decreased from 32.7 to 31.7 accidents per million man hours, but the severity rate increased slightly—from .0676 to .0682 points per thousand man hours. Of course, the total man hours exposure, because of the backward season, was slightly less than during the 1949 campaign. However, the record of the industry as a whole was good, and every member of it is to be commended for his efforts in trying to improve his own individual accident experience.

Michigan Ice Industries Association

EDW. D. JACKSON, Secretary

THE thirty-fourth annual convention of the Michigan Ice Industries Association will be held March 1 and 2 at the Detroit-Leland Hotel, Detroit, Mich. The program committee is preparing a program in keeping with the times, and while it is not yet complete, members are assured that it will be up to the minute in every respect. The entertainment, as well as the business sessions, will be top-notch. The Detroit-Leland Hotel has promised plenty of rooms, provided they are notified in advance. Those who expect to attend are urged to make their reservations early.

Indiana Association of Ice Industries

ROBT. W. WALTON, Secretary

THE fifty-sixth annual convention of the Indiana Association of Ice Industries will be held March 4-7, 1951, the first session opening Monday morning at the Lincoln Hotel in Indianapolis. The program has been planned with an eye toward current trends and problems in the ice business, and the international crisis which will affect future activities.

In these uncertain days there is a dire need for group consultation and discussion and we feel that this convention will provide an excellent means of reviewing industry problems. Attendance at this convention will be an investment in the future of the business. While the program is designed to point the way in the trying days ahead, we have not overlooked, the lighter side which is a welcome part of all our conventions. We are planning entertainment which will be enjoyed by all and which no one will want to miss.

To be sure of obtaining the desired hotel accommodations, those who plan to attend the convention should make reservations immediately.

New England Ice Association

RAY T. WILBER, Exec.-Secy.

THE New England Ice Association's Board of Directors met at the Sheraton-Biltmore Hotel in Providence Tuesday, January 9, 1951. At this meeting Bernard Hogan of the Liberty Ice Co., Springfield, Mass. accepted his appointment as chairman of the New England Division of the National Ice Public Relations. The Board voted to hold the annual convention in Providence at the Sheraton-Biltmore the first part of April, possibly 11 and 12.

The film, "Naturally Yours" has been traveling all over New England. This film has been distributed to twenty odd high schools. We are now confirming requests for the film as far in advance as May, 1951.

We are planning to conduct another ice merchandising school, but specific data is not available at this time. We are also going into the Rhode Island Home and Farm Show at the Cranston Armory during the early part of March. We will have our display in conjunction with the Providence Division of the National League of Fruit and Vegetable Producers and the Rhode Island Market Gardeners Association. The Association recently was entered in the New England Retail Grocers Association's Food Show, which was held in the Boston Garden.

We have had a considerable amount of new ice-using equipment at the I.C.E. Sales Company showroom and also, the Rhode Island Ice Company has been able to employ a young man who is capable of making ice carvings. During the holidays considerable business was made from the sale of ice carvings.

Plastic Pipes for Steel Tubing in Ice Rinks

THE construction of outdoor artificial ice rinks is not ruled out by the present steel shortage, a prominent consulting engineer told the Park Board of Hamilton, Ont., Canada, which inspected four such rinks in Toronto. He said almost all the steel tubing required to freeze the ice could be replaced by plastic pipes that equalled the metal apparatus for all practical purposes. C. A. Meadows, designer for many Canadian arenas and outdoor rinks, pointed out this construction factor to the inspection party as they toured the rinks.

Steel tubing, the greatest single outlay of the critically short metal for a rink, could be replaced by the plastic pipes, Mr. Meadows said. He estimated that the synthetic material could do away with 97 per cent of the steel.

At the Riverdale Terrace Skating Rink, the engineer pointed out where plastic pipes had been used to connect the 13 miles of steel tubing under the ice surface. No Toronto rinks had tried to substitute plastic for metal tubes as the steel had already been delivered, he added.

Canadian City May Build Outdoor Skating Rinks

IN THE light of new materials and processes which permit ice rinks to be constructed with very little steel, Mayor Lloyd D. Jackson plans to ask the City Council of Hamilton, Ont., Canada to study the question, possibly with a view to submitting a proposal for a chain of artificial ice rinks to be voted on by property owners next December.

The mayor was impressed with information received from C. A. Meadows, Toronto, consulting engineer, who said that 10 or 15 outdoor artificial ice rinks could be built and maintained for the cost of one large arena. "I think a program of ice rinks throughout the city would be more of a project for public funds than a large arena," said the mayor.

The Ice Industry

Ice Company Opens Food Stores as Outlet for Ice

SETTING up and leasing of a number of convenient neighborhood grocery stores, "built around an ice storage room" has proven a highly successful and unusual method of increasing ice sales for a leading ice company.

After more than 18 months of steady building, the company has now constructed and leased 30 neighborhood grocery stores. Each store, although built to fit the neighborhood, is a long, narrow room, equipped with moderate, but complete departments for fruit, produce, meats, grocery, bakery products, etc. A special feature in all of them is a sizeable ice storage room, which will offer both block and crushed ice for the housewife, the party-giver, for commercial users, etc.

All of the stores are leased to operators, who receive nine percent of the gross sales in return for management, upkeep of the organization, etc. While putting the lessee plan into operation, the operating company through its merchandising division provides plenty of assistance in choosing the inventory, in making up advertising programs, in salesmanship, etc. Because of the convenient ice storage feature, in addition to a modern, complete stock of groceries, the stores have proven quite popular.

Milwaukee Dealers Raise Ice Prices

ICE dealers in Milwaukee, Wisc. have announced an increase in the price of ice, amounting to five cents on 25 and 50 pound sales. According to Paul Hoff, secretary of the Random Ice & Coal Co., the increase should amount to about $4.00 a year per customer. The price before the increase was 25 cents for 25 pounds; this will hereafter be 30 cents and 50 pound deliveries will be 40 cents instead of 35 cents. The price of ice cubes have not been changed, but Mr. Hoff said this may have to be increased in the near future if costs go up. Costs have gone up lately, he declared, and the operation of trucks costs a lot more. He said this was the first price increase in this area for about two years.

Domestic consumption of ice is still larger than other uses, Mr. Hoff said, in spite of heavy competition of mechanical household refrigerators.

Refrigerated Warehousing Industry

NATIONAL ASSOCIATION of REFRIGERATED WAREHOUSES

Division of American Warehousemen's Association

Executive Offices
TOWER BUILDING, WASHINGTON 5, D.C.

Executive Vice-president
WM. DALTON, WASHINGTON, D.C.

Secretary
JOS. H. COLQUITT, WASHINGTON, D.C.

President
J. L. GAGINI, OMAHA, NEB.

Vice-president
J. P. JOHNSON, WASHINGTON, D.C.

Treasurer
WM. A. MOORE, NEW ORLEANS, LA.

THIS MONTH IN BRIEF

Proposed trade practice rules for the refrigerated storage industry have been submitted by the Federal Trade Commission for consideration by members of the industry and others who may be interested. Individual views concerning the rules may be submitted at a hearing to be held February 8 at Boston, Mass.

Seasonal decrease in use of cooler space during December in refrigerated warehouses was slightly less than average but public freezer occupancy on December 31 was up two points from November 30.

Durable packaging of products placed in cold storage is of much importance to refrigerated warehousemen. Flimsy packaging is direct cause of damage and waste, with consequent damage claims.

Active cooperation with allied trade associations represents an important part of the work of the National Association of Refrigerated Warehouses. The list of these associations will be valuable for reference.

Revised Trade Practice Rules Proposed for Public Refrigerated Storage Industry

PROPOSED trade practice rules for the public refrigerated storage industry, constituting proposed revisions, have been issued by the Federal Trade Commission and were made public January 20 by the Commission for consideration by industry members and all other interested or affected parties.

Opportunity is extended to all interested parties to present to the Commission their views concerning the rules, which may be submitted not later than February 8, 1951. Opportunity to be heard orally will be afforded at the hearing beginning at 9:30 a.m., February 8, 1951, in the Hotel Statler, Boston, Mass., to any such persons, partnerships, corporations, organizations or other parties who desire to appear and be heard. After due consideration of all matters presented in writing or orally, the Commission will proceed to final action on the proposed rules.

The rules as hereinafter set forth are directed to the maintenance of fair competitive conditions in the industry and full protection of the purchasing public. Proceedings to revise existing trade practice rules for this industry were instituted pursuant to industry application in the course of which a general trade practice conference was held in Chicago, Ill., at which rules were submitted for Commission consideration. The announced hearing is a further step in the proceedings.

In the official announcement it is noted that these rules have not been approved by the Federal Trade Commission; they are a draft of proposed rules made available to all interested or affected parties for their consideration.

The proposed revised rules follow:

Group I

RULE 1 — DECEPTIVE ISSUANCE OF WAREHOUSE RECEIPTS.

It is an unfair trade practice for any member of the industry to issue, or cause to be issued, any warehouse receipt which is false, misleading, or deceptive.

Among the practices inhibited by this rule are:

(a) Issuing warehouse receipts without having actual control of the products for which the receipt is issued.

(b) Issuing negotiable warehouse receipts for goods of which the issuer is part or sole owner without full and nondeceptive disclosure of that fact.

RULE 2—DELIVERING GOODS WHEN NEGOTIABLE WAREHOUSE RECEIPT IS OUTSTANDING AND UNCANCELLED.

It is an unfair trade practice for any member of the industry to deliver part or all of any lot of stored products for which a negotiable warehouse receipt (the negotiation of which would transfer the right to the possession of such products) has been issued and is outstanding and uncancelled, without obtaining the possession of such receipt, or taking up and cancelling the same, or placing a statement of what products have been delivered plainly upon it, at or before the time of the delivery of such products, except where delivery thereof is made pursuant to an order of a court of competent jurisdiction or in compliance with a sale made to satisfy a lien thereon, with the capacity and tendency or effect of misleading or deceiving purchasers or prospective purchasers.

RULE 3—DECEPTION (GENERAL)

It is an unfair trade practice to make or publish, or cause to be made or published, directly or indirectly, any false, misleading, or deceptive statement or representation, by way

of advertisement, depiction, or by any other manner having the capacity and tendency or effect of misleading or deceiving purchasers or prospective purchasers, with respect to the quality, character, utility, effectiveness, or nature of any public refrigerated space or facilities or services incidental thereto.

RULE 4—COMMERCIAL BRIBERY

It is an unfair trade practice for a member of the industry, directly or indirectly, to give, or offer to give, or permit or cause to be given, money or anything of value to agents, employees, or representatives of customers or prospective customers, or to agents, employees, or representatives of competitors' customers or prospective customers, without the knowledge of their employers or principals, as an inducement to influence their employers or principals to purchase, rent or contract to purchase or rent, public refrigerated space or facilities or services incidental thereto from such industry member or the maker of such gifts or offer, or to influence such employers or principals to refrain from purchasing or renting public refrigerated space or facilities or services incidental thereto of competitors or from dealing or contracting to deal with competitors.

RULE 5—SELLING BELOW COST

The practice of selling or furnishing public refrigerated space or facilities, or services incidental thereto, at a price less than the cost thereof to the seller or furnisher with the purpose or intent, and where the effect may be, to injure, suppress, or stifle competition or tend to create a monopoly in this industry, is an unfair trade practice. As used in this rule, the term "cost" means the total cost to the seller or furnisher of any such transactions of sale or rental.

RULE 6—INDUCING BREACH OF CONTRACT.

Inducing or attempting to induce the breach of existing lawful contracts between competitors and their customers, or their suppliers, by any false or deceptive means whatsoever, or interfering with or obstructing the performance of any such contractual duties or services by any such means, with the purpose and effect of unduly hampering, injuring, or prejudicing competitors in their business, is an unfair trade practice.

RULE 7—DEFAMATION OF COMPETITORS OR FALSE DISPARAGEMENT OF THEIR BUSINESS.

The defamation of competitors by falsely imputing to them dishonorable conduct, inability to perform contracts, questionable credit standing, or by other false representations, or the false disparagement of the business of competitors in any material respect, or of their business methods, selling prices, values, credit terms, policies, or services, is an unfair trade practice.

RULE 8—PROCUREMENT OF COMPETITORS' CONFIDENTIAL INFORMATION BY UNFAIR MEANS AND WRONGFUL USE THEREOF.

It is an unfair trade practice for any member of the industry to obtain information concerning the business of a competitor by bribery of an employee or agent of such competitor, by false or misleading statements or representations, by the impersonation of one in authority, or by any other unfair means, and to use the information so obtained in such manner as to injure said competitor in his business or to suppress competition or unreasonably restrain trade.

Because of the fact that this February issue of ICE AND REFRIGERATION did not reach readers until after the opening of annual conventions of the American Warehousemen's Association, the National Association of Refrigerated Warehouses, and The Refrigeration Research Foundation, information regarding the programs of these meetings is not included in this issue. The March number will have a full report of all three conventions.

RULE 9—AIDING OR ABETTING USE OF UNFAIR TRADE PRACTICES.

It is an unfair trade practice for any person, firm, or corporation to aid, abet, coerce, or induce another, directly or indirectly, to use or promote the use of any unfair trade practice specified in these rules.

Group II

RULE A—PUBLISHING OF TARIFFS—ESTABLISHING AND ADHERING TO RATES, CHANGES, TERMS AND CONDITIONS IN TARIFFS.

Each member of the industry, while exercising his individual judgment as to his rates and charges and their application to individual lots of varied sizes, should establish and openly state them with his terms and conditions and shall in good faith publish them in a schedule or tariff and should offer and make them without misrepresentation, so long as they are in effect. Any deviation from this ordinary course of business is condemned by the industry.

Refrigerated Warehousing

RULE B—EXCESSIVE EXTENSION OF CREDIT AND UNSOUND COLLATERAL OR UNSECURED LOANS.

Reasonable extension of credit and the making of secured loans at prevailing interest rates to storers and customers is normal warehouse business. However, extending excessive credit, and making or offering to make collateral or unsecured loans not in conformity with existing current sound banking principles, are condemned by the industry.

RULE C—DISSEMINATION OF CREDIT INFORMATION.

The industry records its approval of distributing to its members information covering delinquent and slow accounts insofar as this may be lawfully done.

A Committee on Trade Practices is hereby authorized to cooperate with the Federal Trade Commission and to perform such acts as may be legal and proper in the furtherance of fair competitive practices and in promoting the effectiveness of the rules.

Research on Texas Citrus Fruit to be Expanded

THE Texas Citrus Commission and the U. S. Department of Agriculture have completed plans for an extensive program of cooperative research on the processing of Texas citrus fruits, Dr. G. E. Hilbert, chief, Bureau of Agricultural and Industrial Chemistry, has announced.

The investigations will be conducted, under a memorandum of understanding, at the Bureau's Fruit and Vegetable Products Laboratory in Weslaco, Texas, by Bureau personnel and a scientist of the Texas Citrus Commission. The Commission will provide special equipment needed for this new work.

Dr. Hilbert also announced plans to intensify investigations in which the Texas Agricultural Experiment Substation at Weslaco, Rio Farms at Edcouch, and the U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering are cooperating with the Weslaco Laboratory. An advisory committee is being set up to assist in the coordination of this work, which includes processing research on both fruits and vegetables of the Rio Grande Valley.

Under the expanded program, special efforts will be made to improve the processing of juice and of concentrates from Texas-grown grapefruit, oranges, and tangelos. Emphasis will be placed on grapefruit concentrates to bring processing knowledge on this product up to that for orange concentrates.

Packaging for the Warehouse

Proper packing is important to meet modern needs of economical handling and efficient storing — A message to packaging engineers from a refrigeration warehouseman

HARLAN J. NISSEN
Terminal Refrigerating Co., Los Angeles, Calif.

THE days of isolationism are over. We recognize that internationally. We recognize it by our new concept of, and active interest in, trade associations. We recognize it by such developments as the World Federation of Churches. The concept of mutual consideration of things of mutual interest is a perfectly sound one. But we have been hesitant as industries to recognize our mutual responsibilities with other industries with whom we have mutual or correlated interests.

Take your industry and mine, for instance. We occupy relative positions in the biggest river in the world —the stream of commerce. Our prime interest is reduction of costs. Our customers are one and the same—a satisfied user or consumer. Yet with all this, we each go merrily on our own way looking infrequently to right or left, criticizing the other fellow possibly, but all too seldom using our experiences, our skills and objective observations to help solve mutual problems.

Believing in this philosophy, I welcome the opportunity of being here with you, not just before you, to consider problems of mutual interest. Being an old-timer in the industry—32 years to be exact—I will presume upon that right granted those in their dotage to reminisce, or at least to be mildly historical. Let's indulge for a moment of "I Remember When"—first as to your industry, and then as to mine.

Section of storage room in refrigerated warehouse showing packages stacked with fork truck.

Packaging

I remember when — the cracker barrel — the flour barrel — and the sugar barrel stood in the corner grocery — when prepackaging didn't exist—when the pitcher was brought to the saloon to transport beer home. I remember when—the word "container" was synonymous with wood. That meant rigidity. It means strength. It also meant heaviness, sometimes awkwardness. I remember when—light-weight plywoods didn't exist—the use of the carton was incidental — and when gross weight meant nothing — when nails were long enough to hold a package together—and the wood in a box was heavy enough to protect the contents. I also remember the lack of sanitation, the lack of protection, the absence of cellophane, protective coatings, the dangers of short weight, and all of the sins that good packaging has now corrected.

Warehousing

I remember when labor was under "4 bits" an hour—when a man picked up an 80 pound package without getting tired — when everything was lifted. pushed or pulled by sheer brute strength—and society of 30 years ago can't be too proud of that. I remember when—it didn't cost very much to pile stuff 20 feet high, and if it did you just didn't use that space! I also remember when barrels were tiered with a skid and a home-made block and tackle—and when wooden boxes were strong enough so that you could pile 20 feet high without having the pile collapse.

I remember when you could push a truck load down an aisle and the containers on either side were sufficiently well built so that the truck didn't go right through a light carton. As a refrigerated warehouseman, I remember when—humidity didn't make very much difference and a plus 10 instead of minus 20 was good freezing—when the products offered for cold storage were the remnants, or the worst, rather than the top quality of the current crop of anything. I also remember when—all of these things didn't make very much difference, because costs were low—freight rates were low—mer-

Presented at the third annual Western Packaging and Materials Handling Exposition.

chandising as a science was just being born and the scientific techniques of production, volume distribution, mechanical packaging, modern materials handling—were all in their infancy. It's high time we were brought up-to-date.

The Packaging Engineer And Warehousing

Now, Mr. Packaging Engineer—how much thought have you really given warehousing? Warehousing is not something that is the concern of somebody else. It is your concern, because your boss pays for it, and insofar as warehousing becomes expensive by reason of the package not being designed for good warehousing and good materials handling, just that far have you done an inadequate job. Bang these thoughts against the background of yesterday. Every time a package comes to rest in multiple units, it is being warehoused, whether on the factory floor or the factory warehouse, the public warehouse, a customer's floor, or a retailer's back room. If the retailer warehouse foreman kicks about a lousy package often enough it hurts sales, and don't you forget it. Therefore, the warehouseability of a package is not just my concern, it is your concern as well.

Labor costs more than 5 cents a minute; counting the fringes, vacations, waste time and the taxes directly related thereto, probably more. This means that every time a man handles a 10-pound carton when he could handle a 30-pound carton, he is one one-third as efficient as he could have been. Think about this the next time you design a really small carton with the accent upon sales appeal, and weigh the costs involved. High-cost labor also means that every time a carton is damaged, a flap comes loose, a stack tips over, a crushed carton is repackaged, that a probable preventable cost has been added to the sum total of the merchandising of your boss's product.

Freight claims and damage claims — many preventable — are an evil parasite floating in the stream of Commerce. Surely railroads are wrong, somewhat, but so are you. If I were in the railroad business there would be a long list of flimsy packages that I would refuse to handle, and I would hire a good public relations man to convince the shipper that he was his own worst enemy in shipping inadequately packaged products, for freight claims are an integral part of freight rates.

Part of your job is the integration of new carloading techniques into your package design. Glued unitized pallet loads for all freight handling are not too far away. In 1945, Albert Drake, an authority on materials handling, gave a splendid talk on "Unitized Materials Handling" and today many big companies are integrating production and distribution at the level of single packages weighing a ton, namely the strapped or glued unitized pallet load. The savings are enormous and the packaging engineer has a place in this picture.

This paper, presented by a practical refrigerated warehouse operator of many years experience emphasizes the value of durable packaging of products that are placed in storage. Flimsy packaging, he says, frequently causes much waste and damage.

Let's get down to some more cold facts. Dale Carnegie did not include fault finding among the attributes of "How to Win Friends and Influence People". However, I am in San Francisco, and what chance has an "Angeleno" here anyway? Tomorrow, I will be back in the smog belt again cussing the smoke from the thousands of new industries in Los Angeles County. So here goes!

What's Wrong With Packaging

1. The packaging engineer who designs a square package is, from the materials handlers point of view, a villain. The common brick isn't shaped that way just by chance. You can't tie or stack square packages. Yet some of the largest corporations in the business are packing products in cases where the horizontal dimensions are identical, rather than brick-shaped or rectangular. From a materials-handling point of view, the square package is impossible. Design your package as to shape so that it ties into a firm stack.

2. Have in mind that every new warehouse today, including your customer's, is designed around a mechanized pallet. With the improvement in fork design, more multi-storied warehouses will be palletized and mechanized. Did you ever stop to think how flimsy the structural strength of today's carton is? Sure, what difference does it make if the product itself has structural strength? A can, for instance, or a compact, rectangular, solidly filled package, provide internal structural strength. In the frozen food field, spinach is packed 14 oz., peas 12 oz., broccoli, 10 oz., all about the same sized carton. The density of the first is 40 percent higher than the density of the third. The lighter density of the third makes high piling relatively impossible without vertical pallet supports. Broccoli, cauliflower and similar vegetables which do not lend themselves to compact packaging, should have structural strength added to the carton sides to prevent crushing. Otherwise it is inevitable that the cost of handling those particular products must reflect a higher cost. One item pays for the cost of handling the other, which is unfair. Frozen food packaging is used just as an example.

3. Package Sizes. Time studies indicate that the package most economically handled by hand lies within the range of 30 to 60 pounds. All packages are hand-handled many times along this stream of commerce, regardless of the development of mechanization. I can remember when cheese was packed three 25-pound wheels in a fine square wooden box that could be piled 30 high without a question. Today these daisies are inserted in a flimsy carton which isn't much more than a glorified paper bag—the container having no structural strength. And if the warehouseman wishes to use the upper half of his warehouse, the half nearest the ceiling, he has to create vertical support, and if he doesn't, the other half of this warehouse is wasted. You can't waste half of anything unless one of two things happens, bankruptcy or increased unit cost. So think over the structural strength of containers, unless your product itself is capable of bearing the weight, because all packages are piled somewhere along this stream of commerce, and crushed packages and waste of space are the result.

Unfilled Space a Hazard

4. Be sure that the sum total of the inner packages is accurately calculated in figuring the outsize of the outside container, and don't tell me you always do—because you don't. Every warehouse, and possibly your customers, have received cases in which there is unfilled space at the top of the container. A ride on the train or the jouncing of a truck will cause these cases to telescope, giving the package a sloppy appearance when piled, which ruins the exterior appearance and makes high piling impossible. If you fellows only knew how many times you have been cussed out by warehouse foremen all over this nation, you would shudder!

But don't take this item for granted. If you do order the proper case size, be sure it is properly stapled, and for heaven's sakes, be sure it is properly glued.

5. Glue and the surface consistency of the packaging material. Humidity, temperatures, moisture, stress, all have their effect upon glue. You know that, but you fellows take a lot for granted, and incidentally, when the item you package is subject to inspection maybe there is a glue that will hold the top of the container together and still not force the destruction of the container when opened for inspection. With more merchandise being offered to the government, the Vet Corps and Army inspectors will open thousands of cases, thousands of packages, before the next year is over. Think about it.

Usefulness of Glue

As you know, glue is being currently used by many warehousemen to fix or to stabilize stacks in palletizing. This is a special kind of glue which is brittle and breaks easily when lifted, but has great strength against side slippage, and speaking of slipping, I come to another of a warehouseman's favorite gripes. You don't have to use a cardboard which has the surface of a skating rink, do you? Just remember in the olden days when labor was cheap, loads went around corners at less than a mile an hour. Today, loads in ton units on fork trucks go around corners at several miles an hour, and somebody pays the bill if the top tier of packages slips off into the great beyond, just because some packaging engineer let an ultra-slick surface be used on an admirable piece of fibreboard. The frictional values of container surfaces are worthy of your consideration.

6. Color or symbol designation. In the olden days when a crew of men walked into a room, small numbers or small writing was readily discernible and the crew could pick out the proper merchandise readily. Today, however, mechanized equipment moves in quickly. The Army and Navy recognized this in the last world war and used the crescent, circle, triangular or square symbol to make different merchandise readily discernible. Smart packagers today can well add color designation. Using frozen food again, why not orange juice in orange print?, Lemonade in yellow?, peas in light green?, spinach in dark green?, corn in gold? Admittedly there aren't enough colors for all the vegetables in the world. The primary items can be so designated. I realize that in this audience there are engineers whose interests do not lie in the food field. But whether your commodity be soap or drugs, I believe color engineering has its place in a practical side of packaging as well as the esthetic side. Operations will be speeded up and mistakes may be avoided.

The packaging industry has only touched the surface in the packaging of fresh fruits, vegetables and flowers. While eye appeal, weight of container as related to freight rates and consumer sizes for sales appeal are all important to packaging men, they must not forget that the primary purpose of a container is to protect its contents.

The refrigerated warehouseman has been criticized for years for not sufficiently inhibiting, by mechanical means, the natural processes of desiccation. As our industry, guided by The Refrigeration Research Foundation, under our mutual friend Dutch Diehl, has studied these shortcomings, and admittedly there are many, we came across the fact that the poultry industry had been sadly remiss in the field of packaging. Significant improvements in vapor proofing, weight standardization, as well as eye appeal has come about as a result of these studies.

Other Packaging Problems

Let's go fishing for a moment. As many of you know, thousands of tons of shrimp are packed in 5-pound packages in the Gulf of Mexico and the Gulf of Lower California. They are highly perishable and before being put in a 5-pound package they are heavily glazed to prevent spoilage and desiccation. One packer was confronted with the problem of having no transportation, no roads, no railroads, so he bought himself a cargo plane; but being confronted by the 64 dollar question of weight, he could not see why he should transport an extra 20 percent of weight. Good packaging engineering found the answer.

A vapor-proof liner eliminated glazing, and gave an effective seal, created excellent eye appeal, and reduced freight costs 20 percent when he finally did get them to the railroad. With these and other improvements in fish packaging and poultry packaging in mind, if I could look into a little crystal ball, I would offer "youse guys" a suggestion in a field which is wide open, the meat industry. Now the packers will tell you that they have done prepackaging of certain meats since 1935 with indifferent success, but I'll predict that within the next five years, meat prepackaging will have made significant progress as compared to the sale of bulk meat. Which one of you fellows will be in on the deal?

These are just a few of the many commodities in which your industry and ours have much in common. If I were to hazard a guess, I would say the packaging industry has only touched the surface in the packaging of fresh fruits, vegetables and flowers. Sounds silly, doesn't it, packaging flowers! But the use of pads containing preservatives, such as bisulphite, has only been touched. Cheap pads containing a mild inhibitant can make possible the wider use, more effective distribution, and less loss of countless products considered to be in the highly perishable class today. If a fruit or a vegetable does better in an artificial atmosphere, and Dutch Diehl can tell you about many that do, why not an artificial atmosphere in a plastic bag containing said product? Kind of interesting, isn't it? And not wholly whimsical.

You know this gets back to the "I Remember When" business, and high school economics (time and place utility). When things cost a dime a pound, a lot of these ideas were silly, but now that many foods are at the level of $1 a pound or more, percentage cost of packaging can give some of these ideas practical value. Now, as a warehouseman, I recognize that the packaging industry has been greatly concerned with eye appeal, weight of containers as related to freight rates, and consumer sizes for sales appeal. But let's not forget that the primary purpose of a container is to protect its contents from the point of production through distribution to the point of consumpion, safely and economically, and that the warehouseman, the materials handling engineer, and the transportation industry share your concern over safekeeping and economical handling. We are working for the same boss, a satisfied customer and, thank God, we are working for him in the healthy environment of free enterprise where constructive criticism, new ideas, unfettered competition, mass production, and the American way of life, make progressive ideas possible and their adoption practical.

December 31 Cold Storage Holdings

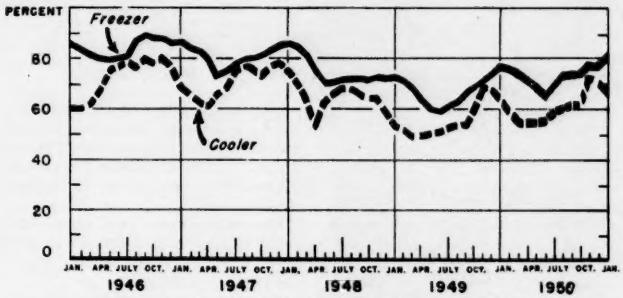
THE seasonal decrease in the utilization of cooler space during December was slightly less than average. On December 31 coolers were 67 percent occupied, a decrease of four points since November 30. The average December decrease in cooler space occupancy was five points. The East South Central Region was the only area showing an increase in the use of cooler space, while occupancy in the West South Central Region remained uncranged from the preceding month. All other regions showed decreases of three to six points.

Public freezer occupancy, up two points from November 30, equaled the average December 31 occupancy level of 81 percent. A year ago this time freezer space was 76 pereent occupied. Decreased utilization of space during December took place in the Middle Atlantic, East South Central, West South Central, and Pacific Regions. Freezer occupancy increases in the remaining areas ranged from five to 11 points. Freezer space in the majority of key cities was filled to near capacity on December 31, however, only in Detroit, St. Louis, and Nashville was cooler space above 80 percent occupied.

The total weight of cooler and freezer items in storage December 31 totaled 5 billion pounds. Cooler commodities at 2.9 billion pounds were almost a half billion pounds below November 30 stocks, while freezer items amounting to 2.1 billion pounds were about 100 million pounds above November 30 holdings. The net decrease in weight of both cooler and freezer foodstuffs during December was about 300 million pounds. The removal of fresh apples from storage remained the main contributing factor to the net decrease in cooler weights. The into-storage movement of frozen pork played a similar role in accounting for the net increase in the weight of freezer commodities.

(Data for this report are collected from public, private, and semiprivate warehouses, apple houses, and meat-packing plants. Commodities in space owned or leased and operated by the armed services are not reported. All December 31 figures are preliminary).

Net withdrawals of frozen fruits during the month were almost twice the average December seasonal reduction. Stocks were down 33 million pounds from a month earlier and totaled 446 million pounds. This compares with 300 million pounds in



Occupancy of public refrigerated warehouses, 1946-1950

Fruits and Vegetables

Seasonal withdrawals during December of six million bushels of fresh apples left 34 million on hand which was an all-time high for any December 31 on record. Stocks of pears were reduced to 1.6 million bushels, reflecting a net decrease of 600,000 bushels during December.

store last year and average December 31 inventories of 370 million pounds.

All frozen fruit items except apples and miscellaneous fruits reflected seasonal net reductions during December, the greatest being reported in stocks of strawberries, orange juice, and cherries. For this time of year, however, holdings of

TABLE I—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS.)

	Dec. 31, 1950	Nov. 30, 1950	Dec. 31, 1949	Five-year Average
Meat and meat products, lbs.	790,874	545,098	724,804	700,585
Lard and rendered pork fat, lbs.	70,862	57,794	73,995	91,052
Frozen poultry, lbs.	281,601	269,640	292,513	288,661
Creamery butter, lbs.	105,364	159,873	113,993	50,456
American cheese, lbs.	188,519	233,733	168,670	126,032
Other cheese, lbs.	18,546	20,338	16,428	18,415
Shell eggs, cases	26	61	110	269
Frozen eggs, lbs.	48,655	75,582	53,902	105,778
Apples, bu.	33,561	40,032	26,563	23,536
Frozen fruits, lbs.	446,377	479,353	300,409	370,460
Frozen vegetables, lbs.	425,279	454,011	371,003	293,778
Frozen fish, lbs.	158,809	165,394	146,813	144,928

TABLE II—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu. ft.)		Dec. 31, 1950 (%)		Nov. 30, 1950 (%)		Dec. 31, 1949 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	2,977	5,501	66	87	71	77	59	87	52	83
Middle Atlantic	35,355	31,018	71	85	74	87	61	75	64	82
East North Central	29,056	26,793	68	84	72	79	66	74	63	81
West North Central	9,526	14,725	74	85	77	76	73	82	65	84
South Atlantic	7,913	6,704	58	80	62	69	61	79	63	85
East South Central	2,821	3,252	81	83	78	84	62	81	68	79
West South Central	7,139	6,913	59	60	59	61	62	60	65	79
Mountain	1,518	1,947	63	88	68	83	61	78	58	81
Pacific	18,262	21,028	59	76	65	79	65	78	66	76
United States	114,567	117,881	67	81	71	79	64	76	64	81

TABLE III—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent				Net Piling Space (000 Cu. Ft.)		Space Occupied			
			Dec. 31, 1950		Nov. 30, 1950				Dec. 31, 1950		Nov. 30, 1950	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	80	103	79	77	84	76						
Middle Atlantic	1,449	1,175	70	80	65	75	1,213	265	81	86	97	83
East North Central	3,596	1,481	84	61	85	88	4,443	1,150	92	87	93	90
West North Central	490	2,151	95	87	100	70	12,077	5,934	91	80	86	68
South Atlantic	430	2,514	91	70	28	51	955	228	83	100	85	100
East South Central							351	94	80	88	81	88
West South Central	202	31	58	100	61	94	2,281	372	100	100	100	100
Mountain	102	369	95	62			716	437	85	96	100	100
Pacific	4,079	3,362	45	70	53	76	2,835	589	97	96	90	92
United States	10,428	11,186	67	73	69	73	24,871	9,069	92	84	89	76

NOTE: Blank spaces indicate that insufficient returns were received.

grapes and strawberries were at new highs, with 30 and 97 million pounds, respectively, in store.

Frozen vegetables, too, were being moved from storage in greater than average amounts. The 29 million pound net decrease last month compares with an average 20 million pound December seasonal withdrawal for the 5-year period ended 1949. Despite greater than average net withdrawals, stocks of all frozen vegetable items except asparagus, cauliflower, spinach, pumpkin, and squash were at an all-time December 31 high.

Dairy and Poultry

National holdings of butter dropped to 105 million pounds by December 31, thus reflecting a net withdrawal of 55 million pounds since November 30. This seasonal reduction compares with 16 million pounds withdrawn from store last year and 27 million pounds, the average December net decrease during the 5-year period ended 1949. Although current stocks were below last year's holdings, they were more than twice the December 31 average.

American cheese holdings of 189 million pounds were still at a record December 31 high despite net withdrawal of 45 million pounds.

The 26,000 cases of shell eggs in storage were the lowest for any December 31 on record. Frozen egg supplies were down to 49 million pounds which compares with 54 million pounds in storage last year and 106 million pounds average December 31 holdings.

Seasonal increases in poultry stocks during December were about average with a net increase of 12 million pounds. National holdings totaled 282 million pounds which were below average and the holdings of last year. The greatest seasonal gains were reported in stocks of fryers, roasters, and turkeys. These poultry items totaled 22, 20 and 112 million pounds respectively, on December 31.

Meats and Meat Products

National holdings of all classes of meats in storage amounted to 791 million pounds by December 31 as almost a quarter billion pounds of meats moved into storage during the month.

Commodity-wise, beef stocks totaled 145 million pounds. This compares with 121 million pounds stored this time last year.

Pork at 518 million pounds reflected a seasonal net increase of 192 million pounds. Frozen pork stocks more than doubled since November 30 and by the end of last month totaled 296 million pounds which was 55 million pounds greater than last year's supply.

Lard and rendered pork fat holdings were up 13 million pounds since November 30 and amounted to 71 million pounds by the end of last month. This seasonal increase was some 20 million pounds less than last year but total holdings were only three million pounds below last year's supply.

Fishery Products

A seasonal decrease of seven million pounds during December brought national holdings of frozen fishery products down to 159 million pounds by the end of last month. This compares with 147 million pounds in store last year and average December 31 stocks of 145 million pounds. Cured fishery products totaled 22 million pounds which was slightly above average for this time of year.

Storage Outlook

Public cooler occupancy in its second month of a seasonal decline dropped only five percentage points since the peak on October 31 last. In the corresponding period for the five years ended 1949, the seasonal decline was seven points. Cooler-held commodities such as apples and cheese still are at unseasonally high levels and so occupancy by the end of this month may not drop as much as the 5-year average would indicate, which normally is a 3-point decrease during January. Freezer occupancy moved upward during December by two points and was undoubtedly at its peak with 81 percent occupancy. According to past performance, however, this month's freezer occupancy should decline about one point as seasonal withdrawals of freezer-held commodities gets under way during January.

Canadian Holdings of Fruits and Vegetables

THE Dominion Bureau of Statistics of Canada, Agricultural Branch, reports the following commodities held in cold storage on December 1, 1950.

Apples in cold storage on December 1, 1950 amounted to 8,101,000 bushels compared with 8,920,000 bushels December 1, 1949, and 8,837,000 bushels November 1, 1950.

Frozen fruit holdings in storages and factories December 1, 1950 amounted to 17,641,000 pounds as compared with 15,614,000 pounds December 1, 1949 and 18,023,000 pounds November 1, 1950.

Sticks of frozen vegetables in storages and factories on December 1, 1950 amounted to 12,516,000 pounds as compared with 7,335,000 pounds December 1, 1949 and 13,395,000 pounds November 1, 1950.

Processing Capacity Enlarged

THE Omaha Cold Storage Co., Omaha, Nebr. is enlarging its processing operations in northern Nebraska following the purchase of the Frank Pilley and Sons plant at Norfolk. The concern already has one Norfolk plant. The company plans to spend about $100,000 in enlarging and improving the Pilley plant, according to President H. C. Sheridan of Omaha.

November Holdings Frozen Fruits and Vegetables

STORAGE stocks of frozen peaches, raspberries and strawberries on November 30 amounted to 157 million pounds. Of this amount 116 million pounds were classified according to package size. Sixty-six percent of the peaches, 73 percent of the raspberries, and 76 percent of the strawberries in storage were reported by type of container.

This compares with a relative coverage of 70, 76, and 75 percent on October 31. The proportion of stocks in packages of one pound or less has remained about the same for the past three months with approximately one-fourth of the peaches and raspberries in the smaller containers.

FROZEN FRUITS AND VEGETABLES IN PACKAGES OF ONE POUND OR LESS IN STORAGE NOVEMBER 30 AND OCTOBER 31, 1950—000 LBS.

	Nov. 30, '50		Oct. 31, '50	
	lbs.	pct.	lbs.	pct.
Peaches	3,351	25	3,656	26
Raspberries	6,093	27	6,505	26
Strawberries	33,225	41	35,859	42
Asparagus	5,049	76	5,429	75
Beans, lima	25,030	59	28,357	59
Beans, snap	22,853	69	24,058	68
Corn, sweet	14,427	51	15,630	49
Peas, green	50,621	63	55,377	62
Spinach	10,953	85	9,949	78

Sixty-two percent of the November 30 stocks of the selected frozen vegetables, which totaled 327 million pounds, were classified by warehousemen as to container size. Of the 203 million pounds classified, 64 percent were reported to be in containers of one pound or less. This compares with 62 percent reported in this type package last month and 59 percent reported a year ago this time.

The ratio of retail to institutional-size containers on November 30 remained the same as the previous month for lima beans, with 59 percent of classified stocks in the smaller containers. Asparagus, snap beans, and peas each showed a one point increase during November in the percentage of classified stocks in retail packages while corn increased 2 points.

Fact Finding Conference

THE twenty-second annual Fact Finding Conference of the Institute of American Poultry Industries will be held at the Municipal Auditorium, Kansas City, Mo., February 11, 12 and 13. The program will be devoted largely to present economic and business conditions, including possible government controls.

Allied Trade Associations Furnish Valuable Contacts for NARW Members

A VERITABLE gold mine of information is to be found in the files of trade associations representing industries allied with the business of cold storage. Active cooperation with these groups plays an important part in the daily activity of NARW. A constant interchange of advice and assistance on problems of mutual concern is carried on between the representatives of NARW and the following trade organizations:

AMERICAN MEAT INSTITUTE, 59 E. Van Buren Street, Chicago 5, Illinois. President—Wesley Hardenbergh. Associate Director, Department of Marketing—J. Russell Ives.

INSTITUTE OF AMERICAN POULTRY INDUSTRIES, 221 N. LaSalle Street, Chicago 1, Illinois. President—Cliff D. Carpenter. Jane Wasmuth, Editor.

INTERNATIONAL APPLE ASSOCIATION, 154 East Avenue, Rochester 4, N. Y. President—Victor H. M. Joseph, Secretary—Samuel Fraser.

NATIONAL ASSOCIATION OF FROZEN FOOD PACKERS, 1415 K Street, N.W., Washington 5, D. C. President E. J. Watson, Pictsweet Foods, Inc., Mt. Vernon, Washington. Secretary-Manager, L. S. Martin.

NATIONAL POULTRY, BUTTER & EGG ASSOCIATION, 110 N. Franklin St., Chicago 6, Illinois. President—H. C. Carbaugh, Tennessee Egg Company, Chattanooga, Tennessee. Executive Secretary—Harrison F. Jones.

NATIONAL WHOLESALE FROZEN FOOD DISTRIBUTORS, Inc., 60 East 42nd Street, New York 17, N. Y.—President —Alvin W. Langfield, Frozen Food Distributors, Oakland 8, Calif. Executive Director, Harry K. Schauffler.

UNITED FRESH FRUIT & VEGETABLE ASSOCIATION, 2017 S Street, N. W., Washington 9, D. C. President—Harold E. Bryant, Maine Potato Growers, Inc., Presque Isle, Maine. Executive Vice President — C. W. Kitchen.

NATIONAL FOOD DISTRIBUTORS ASSOCIATION, 110 N. Franklin Street, Chicago 6, Illinois. Secretary & Manager —E. J. Martin.

NATIONAL CHEESE INSTITUTE, 110 N. Franklin Street, Chicago 6, Illinois. President—L. D. Schreiber. Executive Secretary—Dr. E. W. Gaumnitz.

PACIFIC DAIRY AND POULTRY ASSOCIATION, 1304 East 7th Street, Los Angeles 21, California. President — G. H. Brockmeyer. Executive Secretary, Henry D. Greene.

NATIONAL LEAGUE OF WHOLESALE FRESH FRUIT & VEGETABLE DISTRIBUTORS, 512 F Street, N. W., Washington 1, D. C. President—James F. Solley, Jr., James F. Solley and Company, Inc., 213 South Charles Street, Baltimore, Maryland. Secretary—John R. Van Arnum.

AMERICAN BUTTER INSTITUTE, 110 N. Franklin Street, Chicago 6, Illinois. Executive Secretary—Russell Fifer.

NATIONAL FOOD BROKERS ASSOCIATION, Munsey Building, Washington, D. C. National Chairman, Ed W. Jones, Meinrath Brokerage Company, 20 West Ninth Street, Kansas City 6, Mo. President—Watson Rogers.

NATIONAL APPLE INSTITUTE, 726 Jackson Place, N. W., Washington 6, D. C. Executive Secretary — Truman Nold.

AMERICAN BAKERS ASSOCIATION, 20 N. Wacker Drive, Chicago 6, Ill. Secretary—Tom Smith.

NATIONAL BEER WHOLESALERS ASSOCIATION OF AMERICA, INC., 203 N. Wabash Avenue, Chicago 1, Illinois. Russell H. Hopkins, Director.

AMERICAN FARM BUREAU FEDERATION. Allan B. Kline, Pres., 109 North Wabash Ave., Chicago, Ill.

NATIONAL CONFECTIONERS' ASSOCIATION OF THE U. S., 1 N. LaSalle St., Chicago 2, Illinois. President—Philip P. Gott.

NATIONAL CANNERS ASSOCIATION, 1739 H Street, N. W., Washington 6, D. C. Secretary—Carlos Campbell.

DAIRY INDUSTRY COMMITTEE, Barr Bldg., Washington 6, D. C. Executive Secretary—M. H. Brightman.

AMERICAN INSTITUTE OF FOOD DISTRIBUTION, INC., 420 Lexington Ave., New York 17, N. Y. President—Gordon Cook Corbaley.

NATIONAL ASSOCIATION OF FOOD CHAINS, 726 Jackson Place, Washington 6, D. C. President—John A. Logan.

INTERNATIONAL ASSOCIATION OF ICE CREAM MANUFACTURERS, Barr Bldg., Washington 6, D. C. Executive Secretary—Robert C. Hibben.

NATIONAL ASSOCIATION OF MARGARINE MANUFACTURERS, Munsey Bldg., Washington 4, D. C. President—Paul T. Truitt.

NATIONAL PRESERVERS ASSOCIATION, 839 - 17th Street, N. W., Washington 6, D. C. Managing Director—W. Lowe Walde.

NATIONAL RESTAURANT ASSOCIATION, 8 S. Michigan Ave., Chicago 3, Illinois. Executive Vice-President — Frank J. Wiffler.

NATIONAL FISHERIES INSTITUTE, INC., Victor Bldg., Washington 1, D. C. General Manager—Charles E. Jackson.

USDA Offers Additional Butter For Sale

THE U. S. Department of Agriculture has announced that it is offering for sale, on the basis of competitive bids, an additional amount of 4,900,000 pounds of butter. This quantity represents most of the available supplies remaining in the inventory acquired by the Commodity Credit Corporation, under the price support program for butterfat and manufacturing milk, which have not been committed on the programs previously in effect.

The Department temporarily suspended sales activities for butter on December 21, 1950, in order to appraise its inventory position.

A sales schedule listing the quantities and locations of the lots of butter now offered for sale has been distributed to the butter industry. A total of about 242 million pounds of butter was bought by the Department under the butterfat and manufacturing milk support program which began in February 1949. Of this amount, 20 million pounds have previously been committed for sale or other disposition, and about 4,900,000 pounds is now being offered for sale as announced.

New Warehouse in Minn. For Merchants Refrigerating

A 16-acre tract of land in Hopkins, Minn. (Twin Cities Area) has been purchased by the Merchants Refrigerating Company, New York City, on which will be erected a modern public refrigerated warehouse. Ground has been broken and construction started.

The new warehouse will have approximately one and three-quarters million cubic feet of refrigerated space. It will be of one-floor design, with wide rail and truck loading platforms, palletized handling equipment, blast freezers, sub-zero temperatures, controlled humidities and customer-tenant space. Other facilities and services will be announced later.

Arthur N. Otis, President of Merchants Refrigerating Company, stated the design of the warehouse is the result of many years of operating experience, together with the latest scientific data from the Refrigeration Research Foundation and other sources. The new warehouse is expected to be completed and in operation by next fall.

Pacific Northwest Ass'n. Holds Regular Meeting

THE regular meeting of the Pacific Northwest Association of Cold Storage Warehousemen was held at the Multnomah Hotel, Seattle, Wash., Tuesday, December 5. C. B. Hart, executive committeeman of the National Association of Refrigerated Warehouses briefed the group on the present economic and business conditions in the industry and "Dutch" Diehl for the Refrigeration Research Foundation described the industry's role in feeding the nation and the world in time of crisis.

A proposal ordinance requiring users of refrigerating equipment to obtain a license before installing, moving, altering, or repairing their equipment in Seattle was discussed. The next meeting will be held in Tacoma, February 9.

Tressler Laboratory Taken Over by Norton

KARL B. NORTON, well known for his long and wide experience in the food industry, has taken over the consulting practice and laboratory of Dr. Donald K. Tressler of Westport, Conn. Mr. Norton, who was associated with Dr. Tressler during the early development of frozen foods, continued in that field for many years with General Foods Corporation, and later with Standard Brands Incorporated as production manager of frozen fruits and vegetables. His previous experience was in the chemical manufacturing field with the Allied Chemical Dye Corporation.

Correction

THE article on a statistical survey made by the National Association of Refrigerated Warehouses, published in the January issue, should have been credited to J. L. Gagini, president of N.A.R.W. It was stated that more than a quarter of a million dollars had been invested by cold storage operators to set up existing warehouse facilities, the replacement costs of which would be approximately three-quarters of a million dollars. Obviously, in both cases, this should have read "billion" instead of a "million" dollars. Also, on the third page of this article in the table on mechanization, "Ford trucks" should have read "Fork trucks," and the heading "Here's What Association Members Get for Their Money," should have read "What Associate Members Get for Their Money."

Hygeia Employees Observe J. R. Shoemaker Anniversary

WHEN J. R. Shoemaker, Hygeia Refrigerating Co., Elmira, N. Y., returned from lunch recently, he found on his desk a bouquet of 45 red roses bearing a card of congratulations and good wishes from the Hygeia office force, followed by a double-decker cake inscribed "Happy Anniversary to J. R." There was also a plastic auto with an accompanying horn, going back to the early days when he paddled a bicycle across the main street bridge, also an anniversary card signed by everyone in the organization.

In a letter to the employees, Mr. Shoemaker says as he looks back at the 45 roses which represent a year of his work at Hygeia, he could go back and recall items and events of interest in each of them. Little did he think, he continues, when he came into the Hygeia picture in 1906 that he would be there through two world wars, a great depression, and now the threat (he hopes it will not be more than that) of a third world war which, if it comes, will mean a complete change in our way of life and standards of living. There is no reason to be panicky over the situation, he writes as, if we keep our feet on the ground, think straight, and act accordingly, we can come through on top as we have done before in other times of crisis. But, we can do it only by hard work and personal sacrifices . . . Our forefathers built a free America; our apathy can destroy it. Either we use democracy or we lose it—let's use it!

Poultry Advisory Committee Reviews Poultry Research

AT A three-day meeting in Washington, D. C. January 16-17, with U. S. Department of Agriculture representatives, the Poultry Advisory Committee reviewed poultry research and service work now under way and submitted recommendations as to future work.

In its deliberations the Committee was mindful of adjustments that might be required to more closely gear research and service work on poultry with the National defense effort and urged that special consideration be given to the importance of poultry meat and eggs as food and to measures that will help to get these highly perishable products to consumers in good condition.

The Committee spent one day at the Agricultural Research Center where members had an opportunity to discuss the work being done.

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

A. R. Carlson, Chicago, Ill.

Vice-president National Association Practical Refrigerating Engineers

NEWS

OPERATING

MAINTENANCE

QUESTIONS -- ANSWERS

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HOWARD PETERSON, *Yakima, Wash.*

First Vice-president
A. R. CARLSON, *Chicago, Ill.*

Second Vice-president
ALVIS CLAY, *Memphis, Tenn.*

Treasurer
LELAND KENAGY, *Newton, Kans.*

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EXECUTIVE OFFICE
EMERSON BRANDT, *Secretary*
435 North Waller Avenue
Chicago • Illinois

Getting the Most Out of Chapter Programs

A CONFERENCE on operating methods in the association was one of the features of the 41st annual meeting of the National Association of Practical Refrigerating Engineers. Arranged by Emmett Quinn, then president, it brought out experiences and ideas on numerous phases of chapter operation. Among those who attended this breakfast meeting were many who requested that the material covered be published to guide chapter officers and give information to interested members.

All of the discussions were informal and no one presented a prepared talk. The articles which follow are summaries of the information the different speakers gave.

Refrigeration Course

The methods to use in arranging and presenting a refrigeration course in the chapter were discussed by Elmer Johnson, Los Angeles, who presented the Los Angeles chapter course for several years. He emphasized proper choice of material and declared that it should consist of elementary or fundamental subject matter. Their chapter had used "Refrigeration Theory and Applications" by Venemann as a textbook in these courses and Mr. Johnson assured the group that careful presentation and explanation of the material brings proper understanding of the course on the part of those who attend regularly.

Much he said depends upon the teacher or instructor. His method must be directed at step by step building of knowledge on the part of the students. For instance, most men taking the course will develop ability to use Mollier diagrams if they are first explained on a step by step basis.

Special Speakers

Some of the smaller chapters report problems in connection with obtaining special speakers for their programs. This subject was discussed by L. G. Schroeder of Colton Chapter who said that good management and planning give a rather complete answer. He said that early arrangement of meeting programs is the first requirement. Many speakers are available if they are approached at an early date. Mr. Schroeder recommended that chapter programs be set up at least six months in advance. Then the chapter can secure the speakers it wants and can have a well balanced line-up.

Of course, he said, all speakers wish to have a good audience and the number in attendance sometimes has been a problem to the smaller chapter. Yet the members of the chapter are acquainted with many interested people who will attend as guests if properly encouraged to do so. These measures, Mr. Schroeder continued will take care of the problem of audience size and also develop membership prospects.

Other Program Features

The arrangement and presentation of other program features was discussed by Regis Gubser, Los Angeles Chapter, who has arranged and led numerous quiz and discussion programs for that chapter. He emphasized that every quiz program or discussion should be prepared in advance regardless of the size of the meeting. In Los Angeles Chapter a quiz panel usually is composed of about 4 or 5 people and the leader who prepares a list of questions. These are used only if no questions are submitted from the floor.

Mr. Gubser said it is important for the leader to explain the questions or to define the field of discussion and keep the meeting in this field. Sometimes one or two persons tend to do all the talking and Mr. Gubser cautioned leaders of these events to encourage questions and discussion from a number of people rather than allow it to be monopolized by one or two.

In the smaller groups he said the

quiz or discussion program need not be led by a panel but could be handled as a round-table meeting with all attendants participating. The leader, however, should prepare his subject so that he can fulfill his assignment and keep the discussion on the subject. Mr. Gubser described how a program feature has been developed by having 3 or 4 members study and summarize good magazine articles which they also present to the chapter and discuss with about 10 to 12 minutes allotted to each man for his discussion.

Educational Movies

Recommendations for obtaining and showing good movies were given by Bert McKenna, San Francisco. He stressed the fact that movie subjects close or related to members' interests should be chosen. There are many movies of this type Mr. McKenna said. A good source is the local utility company, and also the local office of large national manufacturing companies frequently can arrange for good movies. Some of these companies also will furnish the projection machine along with the film. Mr. McKenna said that much better attendance can be secured at meetings where good movies are shown if the chapter arranges to send an announcement out early and gives a good description of the program and the movie to be presented.

Publicity

All members were urged by S. A. Cole, Chicago to do more to publicize the educational program and activities of the association. He said that meeting notices should be arranged so that they can be placed on bulletin boards in plants and shops, to give the program and general information about the chapter and its educational objectives. An invitation to attend the meetings should be included, Mr. Cole went on and emphasized how much many engineers could obtain at a very low cost by attending and taking part in the meetings. He said it is important to get this message out to the people who can be benefitted by the meetings and the association program.

Membership

Membership building methods were discussed by Ray Burnett, Los Angeles. He described the methods utilized in Los Angeles to win the contest regularly during the past 4 years. The answer he said, is contests supported by prizes which will develop real enthusiasm in the chapter. He suggested that prizes be obtained early and that they be on display at the meetings so that the members of the chapter will constantly see what they are seeking by their work. It is much better he said, to show the contestants their rewards than to just tell them about the prizes.

The entire membership of the chapter Mr. Burnett said should be divided up into 2 or 3 teams which compete against each other. This encourages good natured rivalry and keeps the contest alive with the members working regularly.

Chapter Officers

How to train and obtain good officers was the subject assigned to Charles Conley, Memphis, who stated that the primary consideration in the choice of any officer is his interest in the association and willingness to devote time to the work he undertakes. Do not pick officers for their position in the industry, Mr. Conley cautioned, but base selection on what the man can contribute to his chapter. He expressed the opinion that members should be tried out and given a chance to show their interest and ability in less vital positions before they are moved up to an office where lack of interest or neglect of duty would prove serious to the chapter.

Cooperation

The methods to be used in selling local industry on the association and to gain its cooperation were discussed by Howard Peterson, Yakima. He said that the fundamentals of the NAPRE organization should appeal to the owners and managers of plants because they are interested in having all workers know as much as possible about their jobs. There are several situations, Mr. Peterson said, where industry should be given more information about the NAPRE and each might be handled in a specific manner. Those plants not represented at all in the membership will require more information. There are other plants which have members among their personnel but information about the association has not been passed along to the management men.

Mr. Peterson recommended that members make it a point to call on and get acquainted with men on the management side. They should be invited to a meeting occasionally as guests. These men also could speak from time to time on the business side of their phase of the industry. The chapter occasionally should schedule talks on methods of cutting operating costs and Mr. Peterson suggested that management men be invited to these meetings.

Members-at-Large

How the member-at-large could gain more from the organization was discussed by Walter Bernd, Sr., Washington, D. C. He said the member-at-large had to be more of an individualist and seek what he wanted whereas a local chapter offers the member advantages which he can secure with a minimum of effort. Mr. Bernd suggested more activity in the association to have all members-at-large make more use of the educational values available. The Question Box was pointed out for special attention by more members-at-large.

At the conventions, Mr. Bernd said he was glad to see that steps had been taken to make members-at-large feel at home and to widen their acquaintance in the work headed by the second vice president.

Reports and Publicity

The value of regular meeting reports sent to national headquarters and of general publicity were discussed by Emerson Brandt, Chicago. He pointed out that the reports published in Ice and Refrigeration have a number of important values. A good meeting report tells the absent member what he missed and encourages him to attend the next meeting. A proper meeting report gives a summary of the educational program and a list of the questions submitted. Both of these are then available for use by other chapters and good meeting reports multiply the value of the local educational program.

Personal News Needed

Personal news and general publicity information are both interesting and valuable and Mr. Brandt declared that National Headquarters would be glad to receive more news of this type about all the members. He recommended that correspondents send meeting reports promptly because it is easier to prepare an early report while delay makes the task more difficult. In closing he emphasized that many non-members read the reports, questions, and other information in the magazine and thus are encouraged to membership.

Special Events

Los Angeles Chapter has been the scene of a number of special events which have given general publicity to the chapter and encouraged interest in the association. These events were described by Ed Nelson who has arranged a number of them. After the meetings have recessed for a month or two in the summertime he recommended a ham and beans feed such as they use to open the season in September. In addition to the food and the meeting, a program of entertainment is presented and it has been a good send-off to other fall meetings.

Old timers night is held once a year and Mr. Nelson said special effort is made to have all the past presidents in attendance, as well as other veteran members. All these old timers are given special recognition and a special program is presented which ties in with the feature. For a number of years the Los Angeles Chapter put on an annual stag party which Mr. Nelson described as a really big one. He said it did much to publicize the organization and usually was quite well attended with overflow crowds the rule.

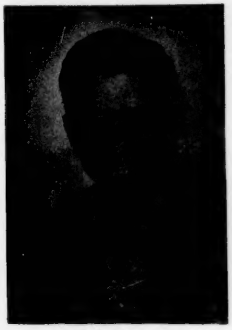
Mr. Nelson concluded with the caution that "special events" should be properly organized and presented, that there is more to a successful affair than merely designating one meeting by special name.

News Notes and Chapter Activities

Los Angeles

By FRED HERR

GEORGE PAULICK of the California Consumers Corp., emerged in the role of double standard bearer as the result of the annual election of officers held by Los Angeles Chapter, on the night of December 13 in the Terminal Club.



George Paulick

The nominating committee, which had met at the Hollywood Roosevelt Hotel a week previous to the meeting night to select a 1951 slate, honored George by nominating him for 1951 president, and then added further distinction by re-nominating him to succeed himself as class instructor.

The slate recommended by William F. Losch's nominating committee was confirmed at the December 13 meeting when it was moved and seconded that Secretary Donald H. Byl be instructed to cast a unanimous ballot for the nominees.

Those who will guide the destinies of California Chapter No. 2 during the uncertain days of 1951 are the following:

President: Mr. Paulick, who was elevated to the chapter's highest office after previous tenures as first vice-president and class instructor (1950), and executive - secretary (1948-49).

1st vice-president, Edgar M. Marrs of the Union Ice Co., who was a member of Regis Gubser's educational committee in 1950.

2nd vice-president, Frank G. Muzzy of Skasol Products Co., who worked diligently on Frank Eccleston's 1950 entertainment committee.

Executive Secretary, Donald H. Byl of the Union Ice Co., who operated so efficiently in this post last year that he was a "natural" for re-election. (Byl was also elected a member of the 1951 advisory board and appointed to the 1951 membership committee).

Treasurer, E. T. Quinn. the immediate past-national president, who was re-elected as chapter treasurer, and also chosen to head up an important new committee, the Public Relations Committee.

Joseph F. Granger, 1950 sergeant-at-arms, also was re-elected and in 1951 will have the additional task of carrying the 1950 membership plaque plus three previously won annual membership pennants to the semi-monthly meetings. (Joe threatens to ask for an assistant, if Ray Burnett and Frank Elliot keep on winning membership trophies.)

The 1951 board of directors is composed of Elmer A. Johnson (chairman), Clifford C. Nordholm, Michael Julius, E. W. Perry and C. P. Scott.

The new advisory board is composed of Dale Rycraft of the Peterson Mfg. Co., retiring chapter president, as chairman; and Rudi Kettler and Donald M. Byl, presidents, respectively, in 1949 and 1948.

The personnel of the 1951 committees was announced as follows:

Educational: Dale Rycraft, chairman; H. N. Royden, F. R. Elliot, Alex M. Shears, F. T. O'Hara, W. H. Krack, Arthur E. Bender, Robert H. Savage and E. W. Smith.

Entertainment: E. L. Nelson, chairman; Frank Eccleston, J. C. Schobert, Fred Nevins, Douglas M. Pickett and Delmar E. Luedtke.

NAPRE Department

Finance: William F. Losch, chairman; Rudi Kettler and Herbert N. Royden.

Membership: W. R. Burnett, chairman; Ralph M. Moore, Donald H. Byl, C. C. Nordholm, Elmer A. Johnson, Frank R. Elliot, V. A. Stubblefield, Maxwell K. Taylor and Henry W. Hawkins.

Attendance: Frank G. Muzzy, chairman; S. E. Brush, H. C. Lyman, J. W. Welsh, and W. B. O'Connor.

Employment: Frank Eccleston.

In addition to the above standing committees, a new committee was established which is known as the public relations committee. Heading this group as chairman is Mr. Quinn, with the committeemen composed of Ed L. Nelson, Herbert N. Royden, William E. Osborn, William F. Losch and Rudi F. Kettler.

For the outstanding job they performed in connection with staging, arranging and conducting the 1950 convention at the Hollywood Roosevelt Hotel, Regis Gubser and E. T. Quinn were given a rising vote of appreciation by the chapter. With characteristic modesty, both promptly proceeded to give the bulk of the credit to others. Quinn said it really should go to Gubser, as chairman of the local arrangements committee. Gubser insisted that credit be given to the members of his committee (Don Byl, George Paulick and Frank Eccleston), alleging that he himself, as general chairman, had merely correlated the activities of the various committeemen.

The chapter decided that both Quinn and Gubser had done a mighty fine job of correlating, or whatever other word they wished to use in describing an outstanding and bang-up job of running off an outstanding convention.

Two films were shown at the December 13 meeting. One, sponsored by Preco, was entitled "Fresh as the Day it Was Packed." The other was a Ford Company production, "The Human Bridge," depicting some phases of the development of the 1949 Ford.

The preliminary class was conducted from 7 to 8 p.m. by Class Instructor Paulick. The subject was a continuation of the discussion of refrigeration temperature control which Paulick had initiated at a previous session of the class.

Chicago

By E. B. JONES

THE final Chicago Chapter meeting of the year was held at the plant of the Agar Packing Co., where chief engineer James Grant had arranged for a complete inspection of the plant and facilities.

The Agar plant is carrying on an extensive expansion and modernization program at the same time it is processing and packing several thousand hogs per day. In order to disturb operations to the least extent possible a new bank of chilling rooms is being added with the top floor room constructed first. The group inspecting the plant saw the second floor room

under construction with the walls primed and ready for application of the insulation.

The engine room proved quite interesting with a large variety of compressors installed. One compressor is steam driven while the others are electric drive. The power comes to the plant at 230 volts which for a plant this size entails quite large switches and bus bars. The new switch house with its power distribution panels proved interesting and Jay Watson explained why it was necessary to rearrange some of the steel supports which were heated unduly by induction current from the 6,000 amp bus bars. Other interesting features were the special processing equipment and the steam generating equipment.

Dallas

By F. W. CUNNINGHAM

The officers elected to serve the chapter during 1951 are:

President, W. E. Weaver
First Vice-president, R. E. Harris
Second Vice-president, E. F. Price
Secretary-treasurer, Tom Weatherford, Jr.
Reporter, F. W. Cunningham

Dallas Chapter expects to show good results in the current membership contest and a prize was set up to be presented to the member who obtains the most new members during the year.

A very interesting and informative talk was presented to the meeting by our member, Elliott Hallowell. His subject was concerned with pumps, especially the centrifugal type. The high point of the lecture was the fact, as he pointed out, that as you increased the head or throttled the discharge you equally or rather proportionately changed and reduced the horse power load of the motor. By the same token he explained that to increase the output of water and at the same time lower the head would increase in a like manner the horse power load of the motor. He advised when buying a motor, to buy the non-overloading type; that is a motor that, at maximum output would be large enough to produce the required horse power without overload.

A change has been voted in the regular meeting dates. Now meetings will be held on the first and third Monday evenings. It is believed that meetings on the first and third Monday evenings will conflict less with the meetings of other organizations and allow more of our members to attend meetings.

Rio Grande Valley

By ARMIN DONEIS

THE question period dealt with the question of how long it would be advisable to let a compressor run "open" in order to wear in a new set of rings after the cylinders had been worked over subsequent to a "roughing-up accident." It was the consensus that it should be run without load until any excessive heating subsides, or until the oil on the cylinder walls no longer shows black. Some machines have needed to run 48 hours or longer before it was safe to close and load them.

The fine points of aligning outboard bearings of compressors by means of strain gauge were gone into in answer to another question, and it was considered feasible when the strain shows up in a horizontal plane to turn the outboard bearing around 180 deg. to use the unworn side of the sleeve bearing opposite the side of drive belt strain. This was suggested in preference to cutting down diameter of pedestal bolts to allow lateral shifting of bearing beyond present limits.

John Muller, instructor, proceeded with the discussion of log sheets dwelling at some length on interpretation of daily reports and prompt action to run down suspicious symptoms. In the course of this discussion the proper location of thermometers and factors likely to cause erratic readings of instruments and gauges were pretty thoroughly gone into, as was also the proper pipe size for liquid connections between condensers and receiver. Several interesting and useful tables were also studied with profit, including one for ammonia discharge pressures and temperatures under varying suction pressure conditions.

Colton

By H. O. BONTER

The new officers elected and installed for 1951 are:

President, F. J. Scherer
First Vice-president, Alvie Miller
Second Vice-president, Fred Willis
Secretary-Treasurer, H. O. Bonter
Sergeant-at-Arms, E. C. Carlson
Chairman, Educational Committee, H. G. Francis

Directors, C. H. Purkiss, E. V. Berchtold and E. H. Carlson.

The chapter members and friends were happy to have E. J. Cowing district manager of the Shell Oil Co., San Bernardino as special speaker. Mr. Cowing gave a very interesting talk on the rapid progress of the oil industries in the United States. He pointed out that there were in the west 30,000 oil wells, 40,000 gas stations, 2,662 oil companies. There are 1,200 products made from oil and 150,000 people have jobs in oil refineries all over the western United States.

With Mr. Cowing were Herbert Ray, district merchandising instructor and Leon Goforth, commercial salesman for the same company. They showed a motion sound picture in color called "Oil Pipe Lines" by the Shell Oil Co. It illustrated the vast amount of work and expense to lay the pipe lines. It showed a line being laid from New Mexico to an Illinois Refinery. It also showed how the pipe nearly two foot diameter was laid across the Missouri River with the aid of special made barges. After the pipe line was completed across the farms and right of way the land was cleaned and leveled. In a few years one would not know that there was a pipe line full of oil underneath. This oil is being pumped by many large pumping stations.

Seattle

By JOSEPH LESTER

AT OUR first meeting of the year we were deeply honored to have as our guest and installing officer National President, Howard H. Peterson. The officers he installed were:

President, W. S. Allen
First Vice President, James Bennett
Second Vice President, Richard Walther
Secretary-Treasurer, Joseph Lester.

After installing our officers, Mr. Peterson gave us a very delightful talk on the possible goals this chapter might reach this coming year.

Our guest speaker of the evening was George Henderson of Latta Bros. Refrigeration Co. His talk was on the renewed medium of refrigeration, the absorption system. A diagram of his system was passed to each member, as he talked. On each separate item we followed him closely. Questions were asked after he explained each item. After Mr. Henderson completed his talk general questions just flew at him. He handled every one till each member was completely satisfied. The meeting ran over-time due to the great interest shown in this system by our members. We look forward to the future for our educational tour of this plant in operation.

The February meeting is being awaited with great anticipation for a trip through the Rainier Brewing Co., of this city.

Stockton-Modesto

By R. M. EDGAR

Our first meeting of 1951 was held in Stockton, where we had a report on the national convention at Los Angeles. Our delegate was H. W. Hedburg who gave us the highlights of the convention as he saw it. Everything went smoothly he said, and he told how well the entertainment was arranged by Los Angeles Chapter. The ladies had a number of special events and everyone enjoyed the time there.

The special question and answer session was described by Mr. Hedburg and he told how one session had been devoted to plant safety and fire hazards. He stressed the fact that everyone must work to reduce accidents and fires. Numerous points were given from Mr. Daly's talk on the Mechanical Refrigerator Car and its uses. All of us got a lot from the report on the convention and attendance from this chapter will increase at the next convention because more of us will want to take advantage of it.

The chapter is very much pleased to receive the membership trophy it won during the 1950 contest for taking in the largest percentage of new members. We hope to be able to keep this trophy longer than just the current year.

We were very sorry to learn of the passing of E. H. Maxwell, chief engineer for Tracy Ice and Development Co., who died suddenly on December 30 at the age of 45. He was a good engineer and was well known in this area. During 1944 he was president of the chapter and was president of Lodge 39 A.F.L. from 1943 to 1945.

Pittsburgh

By Otto Knoch

OUR mid December meeting was in the form of a Christmas Party with all business being eliminated for the evening. The members and friends turned out well for the affair. The entertainment committee supplied the group with various movies. This was followed by a period of singing carols topped off by a delicious lunch and refreshments. Our convention delegate, James Moore, stated he would have a full report of the convention prepared for our January meeting. We are looking forward to the January Ice and Refrigeration issue which will cover the convention.

The Christmas season had added significance for Andrew A. Singer and his wife. They celebrated their golden wedding anniversary. The Singers were honored at a reception attended by their many friends and relatives. The high point of the event came when the couple, still very active in the life of their community, stepped forward and cut a beautiful wedding cake.

Mr. Singer is a charter member of Pittsburgh Chapter who has long been active and interested in association work.

Detroit

By Leon Adams

THE election of officers was held at the final meeting of last year and the following have been elected and installed as 1951 officers :

President, Chas. J. Purdue, Jr.
First Vice-president, Boyd Kitts
Second Vice-president, Roy Burns
Secretary-Treasurer, L. L. Adams
Sergeant-at-Arms, Loran G. Stoops

The Board of Directors remains the same as last year.

The most recent topics of discussion in the educational sessions have been "Condensers," going back to the oldest designs and up to the present day evaporative, and low temperature refrigeration involving several stages and cascade systems.

Memphis

By Charles Conley

The new officers elected and installed at the first meeting of the year were:

President, C. E. Stacks
First Vice-president, Cecil W. Sullivan
Second Vice-president, H. A. Davis
Secretary-Treasurer, Charles Conley
Sergeant-at-Arms, Wm. E. Thweatt
Chairman Educational Committee, Alvis J. Clay
Chairman, Entertainment Committee, Douglas Smith
Chairman Membership Committee, H. A. Simpson

Past President Smithers served as installation officer and explained fully the duties each office entailed. The new officers said they were going to work to make this year the best yet for the chapter. One of the most positive in this regard was Chairman Harry Simpson of the Membership Committee who promised to pack the chapter full of new members so that it could move up to first place in the membership contest.

A report on the Los Angeles Convention was given by Charles Conley. He described the program features and other occurrences. High point in personal interest was the presentation to him of the pyramid prizes as the winner from the small chapters in the national membership contest.

Charles Conley was elected to honorary membership in the chapter. W. J. Derksen, sales engineer for the Mid-South Oil Co., was elected to membership.

Yakima

By Elmer Toop

DANGERS of explosions in hot water tanks unless there is an automatic relief valve in the hot water line were shown in a motion picture presented to the chapter at the first meeting of the period. Another motion picture on the Stockman valve was shown by Elmer Toop. Among the visitors in the meeting were Frank McKune, Everett L. Folsom, James L. Wood and Robert L. Bonebrake of the Inland Pipe Co.

The advantages and disadvantages of automatic refrigeration plants with no engineer or maintenance man in attendance were discussed at the second meeting. It was brought out that under such conditions a serious breakdown of equipment could result eventually with the possibility that fluctuating temperatures might affect the keeping quality of the fruit.

Fresno

By M. Pedersen

The new 1951 officers are:

President, L. A. Lancaster
Vice President, J. C. Bryant
Sergeant-at-Arms, K. W. Findley
Secretary-Treasurer, M. Pedersen
Auditors, C. E. Spillsbury and C. C. Lovejoy

Our new instructor, Thomas Hagar has taken us through the first two chapters in the Lecture Course which covered fundamental units and physical laws underlying refrigeration. Much enthusiasm has been shown by all those present for the way Mr. Hagar explains each question and has made the material interesting for new members as well as old timers. In 1951 as a result we expect increased meeting attendance and more members in the chapter.

San Francisco

The installation of the 1951 officers was arranged as a special affair which everyone enjoyed. The new leaders of the chapter are:

President, Wilbur C. Roberts
First Vice-president, Walter Sandholt
Second Vice-president, Leroy Etzel
Corresponding Sec'y., Robert F. McKee
Recording Sec'y. Charles Stewart
Treasurer, David M. Masters
Sergeant-at-Arms, Fred Imsand

Members of the chapter were invited to bring their wives to enjoy music, refreshments and entertainment at this meeting on January 10. Prospective members were also invited and everyone had a good time.

NAPRE Department

St. Louis

By K. M. Holaday

WATER as the refrigerant in an absorption cycle for air conditioning was discussed in considerable detail by H. C. Pierce of Servel Inc. air conditioning department at the January 15 meeting of St. Louis chapter. The speaker was bombarded with such questions as "How often does the high vacuum have to be repumped to maintain proper operation? What is the efficiency of the unit? Is the condensing water side accessible for cleaning and descaling? Does the absorbent salt solution cause any corrosion of internal surfaces? How much does it cost?" Practical answers to such practical questions made the program a conspicuous success.

As usual members had been invited to have dinner together in the King Cole Room of the Kingsway Hotel and a nice group of members and guests met informally before the Chapter meeting which was held at 8 o'clock in the hotel.

Chairman Les Fleiter announced that plans are under way for the second annual Midwest Regional NAPRE Conference and Refrigeration Round-Up. The date is tentatively set for March 31. Further details will be announced in the near future.

Secretary Wunderlich was kept busy receiving dues payments after the meeting adjourned.

Leland Kenagy Promoted

THE Newton Ice Co., Newton, Kans., has announced the appointment of Leland Kenagy as manager. An employee of the company for the past 20 years, Mr. Kenagy, since 1943 has been chief engineer.

Leland Kenagy

He will continue in this capacity since the two jobs have now been consolidated.

The ice company in addition to its local ice business, operates a locker storage plant and has ice operations in McPherson, Canton and Lyons. Their plant at Sand Creek manufactures ice and supplies railroad car icing service.

Now serving his fifth term as treasurer of the N.A.P.R.E., Mr. Kenagy has long been interested in engineering education. He completed a course in power plant engineering at the Findley Engineering College, Kansas City, and correspondence courses in refrigeration and electricity. In addition he took extension courses from the University of Kansas in engineering, drawing and personnel management. His many friends in the Association are gratified by the recognition of his ability which this promotion of Mr. Kenagy signifies.

N A P R E

Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating problems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

Relief Valve Size

Question No. 871: What size safety relief valve is required for an ammonia receiver 2 ft diameter by 10 ft long?—P.M.K.

Discharge Line Size

Question No. 872: The discharge from this relief valve will be piped to the outside of the plant and will be 80 ft. long. What is the minimum size pipe we can use for this discharge line?—P.M.K.

ANSWERS: Questions 871 and 872 should be answered together, because the size of the relief valve depends not alone upon the size of the ammonia receiver, but also upon the length of pipe from the valve to the outside of the building. The pipe size must be at least as large as the valve size.

For a receiver 2 ft diameter by 10 ft long with 80 ft of pipe the relief valve should be at least ¾ in. and the pipe size ¾ inch standard pipe.

The 1950 revised safety code (ASA B 9.1—1950) establishes the rated discharge capacity of the pressure-relief device in terms of *lb. of air per min.* as determined by the following formula:

$$C = fDL$$

where C = minimum required discharge capacity of the relief device in lb. of air per min.
f = factor dependent upon kind of refrigerant.
D = outside diameter of vessel in feet.
L = length of vessel in feet.

Therefore for an ammonia receiver 2 ft diameter by 10 ft long the relief valve must be capable of discharging not less than 10 lbs. of air per min. This delivery must be made at the required setting of the relief valve, usually between 250 and 300 psig., and against the resistance of the pipe, elbows and other fittings from the relief valve to the outside of the plant.

The formula for determining the internal diameter of a pipe of a given length to deliver the amount of air which is determined by the equation C = fDL, is given in Section 12, paragraph 1.8 of the test code. It is rather complicated and will be omitted here, because the code has also provided a table which gives us the information we want in terms of pipe sizes using standard wall thickness. This is Table 7 in Section 15, paragraph 12. Fig. 1 shows curves which I have plotted from the data given in Table 7, and which may be conveniently used instead of the Table for rates of flow, C, up to 45 lb per min, and with discharge pipes up to 300 feet long. The pipe and valve sizes shown include ½, ¾, 1 in. and 1¼ in. set to discharge at 250 and 300 psig.

Question 871 and 872 are answered quickly by use of these curves by getting the intersection of 10 lb. of air per min. and the equivalent length of pipe which is 80 feet plus 2 feet for each elbow. A ¾ valve set at 250 psig will meet the code requirements with 134 feet of equivalent length of ¾ in. standard pipe. If set for 300 psig the discharge pipe length may be increased to 190 feet.

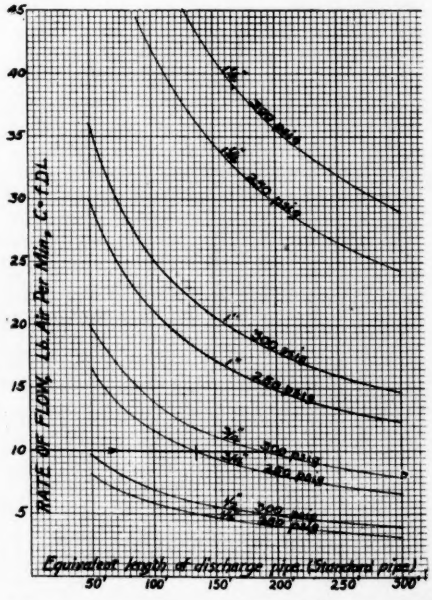


Fig. 1—Size and equivalent length of discharge pipe connected to pressure relief valves.

Example 2: An ammonia receiver is 2 ft-6 in. diameter by 20 ft long. What size relief valve is required, if the equivalent length of the discharge pipe is to be 100 feet, and the valve is set to discharge at 300 psig. Answer: 1 inch.

If the valve is set to discharge at 250 psig the code would not permit a 1 in. valve to have a discharge pipe of more than 72 feet equivalent length.—H. G. Venemann.

Heat Exchangers

Question No. 873: How widely are suction heat exchangers used on Freon 12 systems in larger industrial applications such as 40 tons capacity and up? Is there any particular benefit in a heat exchanger on a larger system?—A.A.R.

ANSWER: I am sorry to say that I cannot tell you how widely suction heat exchangers are being used with Freon 12 industrial plants from 40 tons capacity and up. I find no illustrations or tables of such equipment

in any of the catalogs of Freon compressor builders. Neither have I seen any in operation anywhere. Perhaps some of the members or interested manufacturers will be so kind as to answer this.

I have analysed this problem over quite a range of operating pressures and have come to the conclusion that there are not many cases where the coefficient of performance would be improved sufficiently by the use of the heat exchanger to justify its use. In those cases the temperature of the discharge gas would be so high as to be a source of trouble. I am speaking of a heat exchanger which is installed in the suction line primarily for the purpose of cooling the liquid from the condenser on its way to the expansion valve with suction gas, assuming that said gas is saturated or slightly superheated when it enters the exchanger, and is heated to within 10 degrees of the condensing temperature when it leaves the exchanger.

A question on this subject was answered in the March 1943 issue of ICE AND REFRIGERATION (Question No. 585). It wanted a comparison made of the use of a suction heat exchanger in an ammonia system and in a Freon 12 system. The answer demonstrated that when operating with 90 F condensing temperature and O F evaporating temperature the heat exchanger improved the coefficient of performance from 4.07 to 4.11 with Freon 12 and decreased it from 4.08 to 3.79 with ammonia.

The improvement with Freon 12 was only 1 per cent. A similar analysis with Freon at 90 F and -20 F shows an improvement in c.o.p. of 3.4 per cent. With 114.5 F liquid and -20 F evaporating temperature the improvement in c.o.p. is about 7.5 per cent. In this latter case the discharge temperature would jump from 150 F to 270 F.

New Questions

Booster — When?

Question No. 874: When a part of the plant load is at 0 F temperature and the remainder is carried at 20 F, is it more economical to have the low temperature load placed on a booster compressor? The 0 F load is 22 tons and the 20 F load is 43 tons refrigeration on an ammonia system.—L.B.J.

Fluorine in Ice Water

Question No. 875: Our city is preparing to introduce fluorine into the water for the purpose of aiding in dental protection for the people. It seems to me that some question has arisen in connection with ice manufacture where fluorine treated water is used. Does the fluorine in the water reduce ice quality or make quality ice production more difficult? —O.M.D.

Split Tube

Question No. 876: We have a submerged single pass brine cooler in our 50 ton ice tank. In some manner one of the tubes was split open and brine was pulled into our ammonia refrigeration system. Could this single tube have frozen up and split or is it possible that the tube failed for some other reason? The ammonia pressure was 15 psi and the brine temperature was 12 F at the time. What density or freezing point would you recommend for the brine in this tank which usually has a 12 to 15 F temperature?—A.C.F.

The 1951 officers of NAPRE were photographed at their first meeting after election. From left, standing are Erich Utescher, Chm. Operating Data Book, Bert McKenna, Regis Gubser and S. A. Cole, directors, H. B. Branham, Sgt.-at-Arms, Leroy Etzel, director, Ray Burnett, Chm. Membership, Leland Kenagy, Treasurer. Seated Emerson Brandt, Secretary, A. R. Carlson, Vice President, Howard Peterson, President, Emmett Quinn, retiring president, Leo Vivien, Chairman Board of Directors.

Small Business Concerns Receive Military Orders

THE Department of Defense has reported that of the 1,736,882 purchases of supplies, services, and construction by the military services in the fiscal year ending June 30, 1950, a total of 1,267,000, or 73 percent, were transactions with small business firms.

In dollar value, the report which was prepared by the Munitions Board of the Department of Defense, shows that small business received $1,310,615,000, or 24.5 percent, of the total of $5,355,396,000 spent for defense orders. In addition to receiving direct contracts, small businesses (firms employing fewer than 500 persons) also benefitted from military orders by working as sub-contractors for other military suppliers.

Items such as airframes and engines, ships and heavy ordnance accounted for about 40 percent of all purchases. When these items, which are not produced by small firms, are subtracted from total purchases, about 40 percent of the dollar value of all other purchases of military supplies, services and construction were made from small businesses.

Small businesses were the prime suppliers for one-half to two-thirds of the photographic goods, food, industrial and construction machinery and tools, plumbing, heating and air conditioning equipment, office supplies, and other furnishings. Fifty-four percent of the orders for supplies in the miscellaneous category went to small businesses.

Small business firms also contracted for more than one-third of the electrical goods and equipment, chemicals and paints, and medical goods purchased during the year. In addition, they received 30 percent of all contracts for communication equipment.

Small business contracts for basic materials, fuels and lubricants, and vehicles and equipment accounted for from 15 to 20 percent of all such purchases.

While small businesses received less than 2 percent of the contracts for large items, such as ships, aircraft, engines and turbines, they contracted for 12.7 percent of the ordnance items. These included parts or equipment used with ordnance items such as targets, ammunitions boxes, grenades, mines.

The report points out that many special services have been put into effect to make it easier for small businessmen to find out what products are being bought, the locations of the offices buying them, and how to go about obtaining military contracts.

ENGINE ROOM POINTERS –

Save the Old Transmission

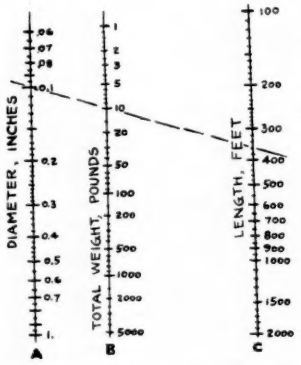
EVEN in old automobiles the transmission, usually, is "pretty good" because the gears are used only for starting. So, don't throw it away. Keep it. It may come in handy. Or, maybe you can sell it to someone who needs it for a variable speed drive.

For example, this writer knows of an instance where a 4-speed automobile drive from an old car was put to work driving a shop tool that required four speeds. The transmission was connected to the machine through the automobile universal joint. Which means that the universal joint, also, frequently comes in handy and should not be thrown away.

Of course it is foolish to keep parts that are just about all worn out. But, it is a pity, often, to throw away those parts that are hardly worn and that can be put to good use.—S. F. W.

What Is the Weight of that Welding Rod or Steel Wire?

THIS chart will be found handy for determining the weight of any length or diameter of welding rod or steel wire. Thus for example if the diameter of the wire is 0.1



inch (See column A) and the length of the wire is 360 ft. (See column C), a straight line drawn through those two points as inidcated by the dotted line cuts column B at a point a trifle less than 10. In other words, column B tells us that the weight of the wire is close to 10 pounds.

But let us suppose that the wire is only 36 feet long instead of 360 feet. In that event the weight would be one pound instead of 10 pounds. Simply move the decimal point one place to the left in 10 and we have 1.0 or one pound.

Now let us suppose that the length of the wire is 3.6 ft. In that event, move the decimal point one more place to the left and the weight becomes 0.1 pound, or, one-tenth of a pound. Or, again, if the length of the wire is only 0.36 ft., which is a trifle more than 4 inches, the weight of the wire becomes 0.01 pound, or, one-hundredth of a pound.

Since column A varies all the way from 0.06 inch to one inch in diameter and column C varies from 100 ft. to 2,000 ft., it is obvious that the chart will take care of almost any combination of diameters and lengths.—W. S. F.

Careful Boiler Maintenance Pays Good Dividends

AN EXCELLENT way in which to check up on boiler maintenance and to assure proper operation is to watch the temperature of the chimney gases. Keep the temperature of the chimney gases as low as practicable. When you do that you can be reasonably sure that the valuable heat is being utilized and is not escaping.

Let us say, for example, that with poor maintenance you find the temperature of your chimney gas to be 750 F. You then "tighten the belt of the boiler", so to speak, by cleaning off the soot, removing the scale, and stopping baffle leaks, and as a result you find that with good maintenance the temperature of the chimney gases drops to 500 F. The reduction in temperature is therefore 250 degrees because 750-500 equals 250.

Now the question is: How much fuel is saved? You will find that out eventually, of course, in the reduction of your fuel bills, but this is the way to figure it: If there are 19 pounds of gas per pound of fuel burned (which is generally the correct amount for coal) and if your fuel contains 14,000 Btu per pound, you multiply the 19 by the reduction in temperature 250 and get 4750. Then multiply that by 24 and you get 114,000. Then divide that by the heat value of the fuel and we get 8.13 which is the per cent of fuel saved. Perhaps you don't know all of the above factors. If not, there is a "rough" method, namely: divide the reduction in temperature by 30. Thus dividing the above 250 degrees by 30 we get 8.33 percent saving which is very close to the more accurate 8.13 per cent computed above.—S.W.F.

How to Determine Right Amount of Oil to Use

I would like to be certain that I am using the right amount of oil, is a statement that is often made by oil users. The answer as given by salesmen, too often, is made so complex that the ordinary lubricant user cannot understand. In fact, in many instances it is doubtful whether the salesman himself knows the correct answer.

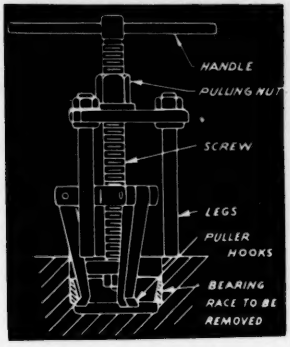
For determining proper lubrication have you ever tried the "stopping time test"? It is an execllent test not only because it is good but because it is so very simple. For instance if you wish to determine whether or not a given steam engine is properly lubricated, just pull out your watch and take the time required for the engine to come to a dead stop after shutting off the steam. The longer the stopping time the better.

It is plain that if a flywheel weighs, say, 2000 pounds, it has a definite amount of energy stored in it when running at normal speed. Therefore, when steam is suddenly shut off, an equal amount of energy is dissipated every time the throttle is closed. By noting the stopping time every night, and by altering the quantity of lubricant fed to the engine every day, the proper quality and amount of lubricant can readily be determined in a period of time.

Motor driven, diesel driven, and steam turbine driven plants can often be treated in the same way. The flywheel effect of pulleys on line shafts and on the machinery itself is sometimes sufficient to cause the machinery to operate for some time after the power is shut off. It is logical that as long as there is a difference in stopping time, all other conditions being the same, there is a difference in lubrication.—F.W.S.

An Excellent Race Puller

THIS sketch shows an excellent race puller that was made by a friend of this writer's—the friend being a first class mechanic. As will be noted, there are three "legs" instead of four. With three legs the same force always falls upon each whereas with four legs that is not



always true. The old-fashioned milk stool, for example, never has "seating" trouble, while a four-legged stool will usually "rock" because the ground is seldom level. Likewise, even machined parts are not always true. Also, the sketch shows that there are three "puller hooks"—for the same reason as above. In addition to removing races of tapered and ball bearings, this device can be adapted to remove many kinds of shafts as every mechanically minded reader will readily appreciate.—S. W. F.

How to Figure Horsepower Of Motors and Diesels

FOR many years the approximate horsepower of an automobile motor has been determined by using the so-called "SAE rule". SAE means "Society of Automobile Engineers". The rule is used by many states as the official rule for licensing automobiles. The rule is: "Multiply the diameter of the cyclinder by itself, in inches; then multiply by the number of cylinders; and then multiply that product by 0.4" For example if it is a 6-cylinder motor and if the cylinders are 4-inches in diameter we have 4 x 4 x 6 x 0.4 or 38.4 horsepower.

Recently this writer was checking some Diesel engine figures and he found that the same rule can be roughly applied to Diesels. Thus for example a 6-cylinder Diesel, 9-inches in diameter, is rated at 195 horsepower. The above rule fits perfectly. For supercharged Diesels use 0.6 instead of 0.4.—W.S.F.

How to Remove Bolt From Worn-out Wooden Hole

HAVE you ever been confronted with the vexing problem of removing a bolt of the type shown in this sketch after the wood refused to hold and the nut was rusted on? The bolt is a so-called "wood-bolt". The squared portion of the shank is intended to hold and prevent the shank from turning. But as every reader knows doubtlessly, your wood often weakens and wears and doesn't hold. As a result you have a "tough time" removing the bolt.

This writer usually performs that little trick by sawing a slot in the head of the bolt with two hacksaw blades held side-by-side in the saw frame as indicated in the sketch. Then, holding the bolt firmly with a screwdriver he usually manages to get the nut off. It is true that this sometimes cannot be done even by soaking the rusted nut in oil. Sometimes the nut is rusted on so thoroughly that the only way is to saw the nut or head off and put in a new bolt. Or, sometimes the nut can be broken off by means of a cold chisel. —F.W.S.

Dimensional Boners

IN THE writer's lifetime he has known of several interesting dimensional boners. A tank, for example, designed by the writer's company, was too large to pass through a door or window. The cost of tearing down a wall was considered, as compared with cutting the tank in pieces small enough to pass through the door. The latter method was adopted as being least costly.

A city in the mid-west built a pump house in readiness for a pump that had been purchased. A nice plan drawing was made showing the pump and motor in place, but the designer "didn't think" of the manner in which the unit would have to be passed through the solid brick walls. On arrival of the pump a meeting of the City Fathers was called for authoritative handling of the problem. How did they do it? They removed the roof of the pump house and lifted the pump up—and then let it down. When a new pump will be needed, as often happens in time, the problem will again present itself—F. S. W.

Finding Ammonia Leaks

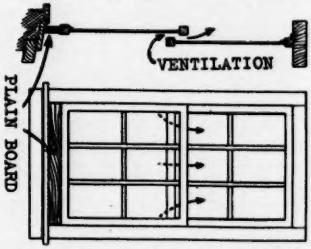
EVERY once in a while this writer sees a letter or article on the "danger" of ammonial leaks. For example, he read a little thing not long ago in which one writer stated that he found muriatic acid and hydrochloric acid on the end of a stick to be "safer" than a sulphur candle when hunting ammonia leaks.

It is said by scientists who have made careful laboratory experiments that by obtaining "just the right proportion" of air to ammonia gas this mixture is combustible, but that just above that proportion and just below it, it is not combustible. Others, who have been in the refrigerating business for a good many years, and even chemists who have handled ammonia all their lives, say that ammonia is not combustible in the ordinary atmosphere, but that it is combustible in pure oxygen in the same way that iron is combustible in pure oxygen.

Under these circumstances, then, why worry about a trifling ammonia leak being combustible in the open atmosphere? The writer has often walked up to an open gas jet and has applied a match to it and has watched it burn. There were absolutely no ill effects. Illuminating gas is surely just as combustible, or even more combustible, than ammonia. Any man who can similarly walk up to a leaking ammonia jet and make it burn would in the wrtier's mind be a very unusual person indeed. —*W.F.S.*

Make Your Own Ventilator

MERELY insert a plain smooth-fitting board beneath the lower half of the window as shown in the accompanying sketch. The board need be only two to four inches high.



Just raise the window, insert the board, close the window down tight against the board, and thus you create a vent between the two halves of the window at the mid-point, current is upward, just as it should be. As a result there is no draft. The writer finds this method to be highly satisfactory in any room where direct drafts are undesirable.—W. S. F.

Frozen Foods

*Reg. U. S. Pat. Off.

PREPARATION PACKAGING FREEZING STORAGE DISTRIBUTION DESIGN CONSTRUCTION EQUIPMENT

Speakers at Frozen Food Luncheon Stress Quality

THE importance of maintaining high quality of frozen foods was pointed out by a number of speakers at the luncheon of the Eastern Frosted Foods Association held November 29 at the Advertising Club, New York City.

J. E. Vollmer, vice-president, The Stouffer Corp., Cleveland, Ohio, recommended that a code of standards be set up within the industry as a means of controlling quality. He pointed out that frozen foods can be mishandled in restaurants, and he suggested that frozen food producers and distributors conduct a campaign to educate restaurant operators in the proper use of frozen food products.

Fred Bauer, Commissary Dept., Merck & Co. Inc., Rahway, N. J., told frozen food packers they should make a special effort to produce items of top quality. There is a wonderful future in frozen foods, he said, but packers of canned foods are completely aware of the inroads that frozen foods are making and this definitely points to the fact that frozen food packers should eliminate all low quality frozen food products.

Mr. Bauer described the operation of the Merck cafeteria which serves some 4,000 meals a day. He said that use of frozen foods have an important part in holding operation costs to a minimum, and provide food that is as near to home cooking as is possible. Use of frozen vegetables, he said, means a substantial saving over the cost of labor that would be required to clean and prepare fresh vegetables.

Jack Hennessey, president J. L. Hennessey Associates, New York, food consultants, said the hotels offer a big market for sale of frozen foods packed in institutional sizes. A substantial increase in their sales, however, can be created only by educating hotel men in techniques of handling frozen foods and by improving the quality of the product.

As a means of increasing the sales in this field, he advised the packers to keep close contact with the manager, steward or hotel chef and keep them informed on the advantages of frozen food. Few hotels have the necessary equipment for handling frozen foods and few hotel men know the techniques of food freezing, he said. Mr. Hennessey was formerly chairman of the board of the Statler Hotel chain.

Frozen Food Convention Plans Announced

FOLLOWING a meeting in December of representatives of the packers and distributors, final plans were made for the annual Frozen Food Industry Convention to be held in San Francisco, Calif., February 26-March 2.

L. S. Martin, secretary-manager of the National Association of Frozen Food Packers visited San Francisco recently and met with the local committee, headed by Alvin Langfield, Oakland, president of the National Wholesale Frozen Food Distributors Association, As an all-industry meeting this event will attract frozen food processors, distributors, refrigerated warehousemen, brokers and suppliers.

Plans are announced for operation of a convention special train from Chicago to San Francisco, leaving Chicago at noon February 22 and arriving in San Francisco February 26. On the way a tour will be made of Yosemite National Park and on the return trip a stop-over will be made at Grand Canyon.

Frozen Fishery Products Same as Previous Year

STOCKS of frozen fishery products held on December 1 by firms reporting to the Fish and Wildlife Service totaled 165,393,716 pounds. This was 6,674,839 pounds more than was held on the same date in 1949, but 711,386 pounds below the November 1 holdings. Items held in considerably larger volume than during the previous year were cod and haddock fillets, halibut, and shrimp. Important decreases occurred in the stocks of rosefish fillets, various forms of whiting and sablefish. During the first eleven months of 1950 a total of 272,645,000 pounds of fishery products were frozen by firms reporting to the Fish and Wildlife Service. This was almost identical with the quantity frozen during the same period in 1949.

1950 Pack of Frozen Peaches

THE 1950 pack of frozen peaches was 18,654,838 pounds, according to a preliminary tabulation prepared by the National Association of Frozen Food Packers. This total was almost 20 percent smaller than the 1949 pack of 23,234,608 pounds.

The principal factor in the reduced pack this year was the decrease in production in the West. In this region, the pack of peaches declined sharply, from 16,516,736 pounds in 1949 to 11,699,687 pounds this year. The pack in the South also declined, and these reductions were not offset by moderate increases in the Northeast and Midwest.

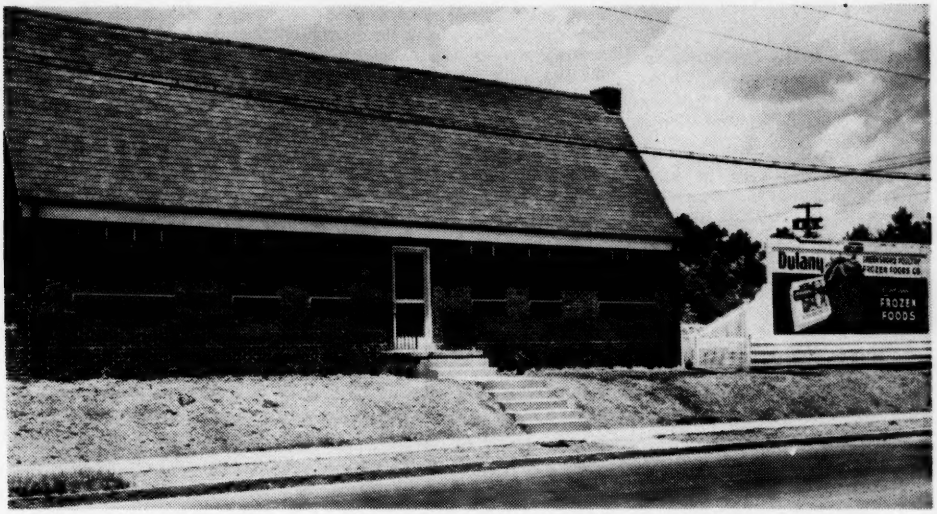
The pattern of container size usage shifted in 1950. The pack in retail sizes dropped significantly, from about 8½ million pounds in 1949 to less than five million pounds.

Freezing Plant Reports Increased Products

SANTA CLARA Frosted Foods, Inc., (Calif.) recently reported a production of 8,000,000 pounds of frozen fruits and vegetables in 1950, marking an increase of 1000 per cent during the last ten years. According to officials, approximately 85 per cent of the products processed by the company, come from within five miles of the plant, and most of the vegetables are packaged and frozen within two hours of arriving from the fields. The company has a nationwide market.

Madeira New Secretary Locker Association

ROBERT L. MADEIRA, frozen food locker operator of Elizabethtown, Pa., has been appointed executive secretary of the National Frozen Food Locker Institute. S. T. Warrington, executive secretary of the former National Frozen Food Locker Association, merged with the Institute last September, has been serving temporarily as secretary of the group. Mr. Madeira served as a member of the joint committee which effected a merger of the two groups at the September convention.



New home of Charlotte branch, Greensboro Poultry Frozen Food Company, 2200 West Morehead Street

Frozen Food Processor Moves Into New Plant

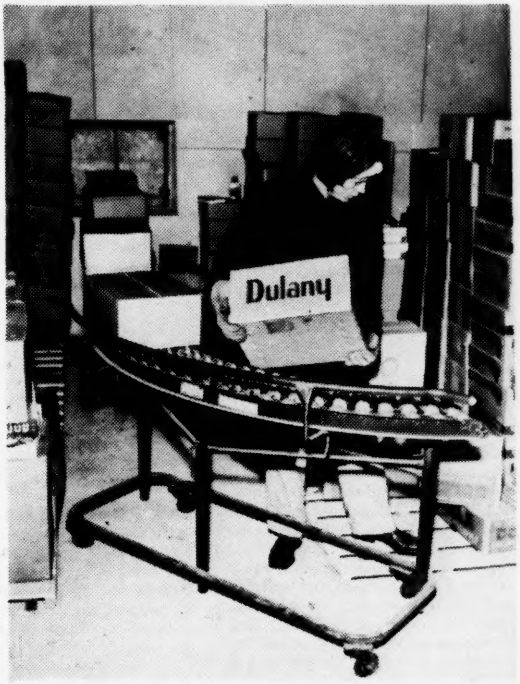
THE Greensboro Poultry Frozen Food Company has formally opened the new home of its branch plant at Charlotte, N. C. A combined office and distribution center for a varied line of refrigerated foods, the plant is equipped for rapid assembly and shipment of customers' orders. The refrigerated section of the plant consists of an ante room at 35 F and a freezer storage held at 0 to –10 F. Conveyors are employed to handle goods in and out of the rooms as stocks are replenished and orders are filled. The refrigeration equipment is designed to maintain desired conditions on an automatic basis.

In 1940 John Balderacchi, president of the company, first started dressing and selling poultry to the trade in Greensboro. The personnel at first consisted of five people, with all deliveries being made from an open truck carrying poultry packed in ice.

Frozen Foods Added

In the beginning, the business was confined exclusively to poultry, and for the first five years was called the Greensboro Poultry Company. However, in June 1945, the firm entered the frozen food field and at this time became known as the Greensboro Poultry Frozen Food Company.

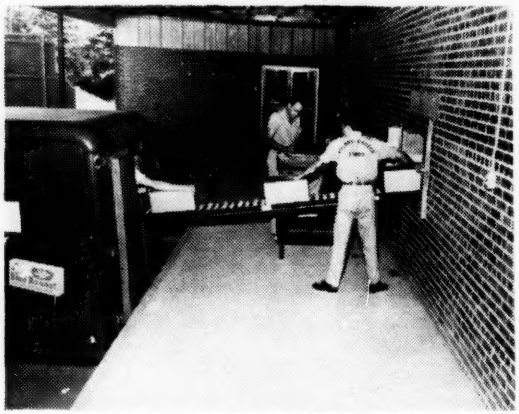
The firm now is one of the largest independently owned and operated frozen food concerns in the South. It maintains its general offices and a home plant at Greensboro, and in addition to the Charlotte plant, it has branch plants at Asheville, N. C., and Knoxville, Tenn. The company now employs 60 people, and during 1949 its volume of business was in excess of $2 million. The operations extend over North Carolina and South Carolina, and parts of Tennessee and Virginia.



Conveyor system carries packages from freezer room to storage and truck.

Frozen Foods

The company is affiliated with Poole's Frozen Foods of Durham and Frozen Food and Equipment Company at Dillon, S. C. While each of these firms operate separately, the three are affiliated under the name of Frozen Food Industries, Inc. Poole's Frozen Foods has plants at Durham, Rocky Mount, N. C., and South Hill, Va., and Frozen Food and Equipment Company has plants located at Dillon, Columbia, and Charleston, S. C., and at Wilmington, N. C.



Checking and loading frozen food packages, from storage to truck.

The Charlotte Branch

The Greensboro Poultry Frozen Food Company's Charlotte branch was established three years ago. Herbert Monte, Jr., is local branch manager and there are five frozen food salesmen, one canned goods salesman, five truck drivers, two warehousemen, and an office assistant engaged in carrying on the operations in this unit.

The new plant is built of brick, concrete and steel, and it has approximately 5,400 square feet of floor space. It is an English type structure, with the front portion of the building used for offices and the back part for refrigeration rooms, storage rooms, and loading dock. The plant has a total of 2,800 square feet of refrigerated space, over half of which is kept at a temperature of from five to ten degrees below zero. All of the equipment in the plant is new and of the latest design available.

An ante room of 5400 cu ft is held at 35 F to accomodate cooler items and also does much to eliminate frosting problems in the frozen food storage. An ample dock along the back of the building gives plenty of space for handling goods without congestion. Conveyors are provided to speed the work of transporting goods into the storages and bringing it out to the delivery trucks.

Refrigerating Equipment

The refrigeration plant is designed for automatic operation with a complete set of controls to maintain desired conditions in the cold rooms. Basic equipment is two forced draft unit coolers, a 5 x 5 ammonia compressor and an evaporative condenser.

Because of the volume of goods handled in and out the refrigeration units face heavy duty. In the 35 F ante room a double blower air refrigeration unit circulates 4000 cu ft per minute to give better than a 2 minute air change. It not only holds the air temperature constant but also reduces the defrosting load in the low temperature room. The cooler unit has float valve control with a horizontal ammonia accumulator and solenoid stop valves on the liquid and suction lines.

The freezer storage has a volume of 13,500 cu. ft. and is refrigerated with a forced air unit equipped with defrosting sprays. Controls are the same as above with the exception of the suction solenoid valve. A tank of calcium chloride brine in the engine room is arranged to circulate the brine through the defrosting sprays on the refrigeration unit.

A 5 x 5 ammonia compressor with 20 hp motor discharges through an oil trap to the evaporative condenser. The compressor is protected by high and low pressure cut-out controls. The evaporative condenser operates from the compressor motor starter and furnishes jacket cooling water to the compressor.

All the refrigeration equipment and connections were furnished by Frick Co. The installation work was performed by the Piedmont Engineering Co., Charlotte, distributors for Frick in the territory.

The company's Asheville plant was established in 1946 and it is approximately 2,000 sq ft of cold storage space. It also has a poultry processing unit where the firm's G. P. brand of poultry is processed and packed. The Knoxville branch was established last year and a new building was recently leased with approximately 2,000 sq ft of cold storage space.

Temperature-Tolerance Studies on Frozen Foods

AT THE Western Regional Research Laboratory, Albany, Calif., a comprehensive project on effects of various storage temperatures and fluctuations in temperature on frozen foods is making good progress according to a report from the Refrigeration Research Foundation. This is a comprehensive, long-term undertaking financed largely under the Research and Marketing Act of 1946 and aided by TRRF as its project No. 32.

Ten rooms (approximately 1,000 cu. ft. each) will eventually be available, with equipment, making possible any needed change in temperature and relative humidity, and these conditions will be under sufficient control so that they can be varied readily and quickly, or automatically for certain purposes. One room has been completed and samples are being stored. Three others are under construction; the other six are being planned.

These large facilities are needed to hasten the progress of the project. A large number of variables must be studied and each test requires a long period (up to eight months). Almost any commercial condition can be simulated. The project will be concerned with numerous problems dealing with raw products, packaging, storage, transport and retail handling of frozen foods.

Industries other than storage (transportation, distribution, retail) all have a direct interest in these studies. With the facilities and staff available, a wide range of problems can be studied over a period of years.

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ICE AND REFRIGERATION

Developing Frozen Concentrated Milk

RECENT investigations by the Bureau of Dairy Industry indicate that it is possible to produce frozen concentrated milk that will remain acceptable as a source of beverage milk for several months after it goes into frozen storage, says the U. S. Department of Agriculture. Certain technical problems of production and distribution must still be solved, however, before frozen concentrated milk can be marketed satisfactorily through regular commercial channels.

In the Bureau's experiments, the product was prepared by heating the milk at relatively high temperature (155 degrees F. for 30 minutes or 170 degrees for 1 minute), homogenizing it at 2,500 pounds' pressure, concentrating it to one-third its volume, cooling, sealing in containers, and freezing.

When the frozen product was stored at a constant temperature of minus 10 degrees F. or lower, there was no appreciable change in flavor or body the first eight weeks. Some samples kept much longer, but usually the flavor tended to become unsatisfactory after eight weeks. When it was stored at higher tempratures, serious defects soon developed, giving the milk a curdy or flaky appearance when it was thawed and reconstituted.

The experimental work also showed that when the milk was concentrated to one-fourth its volume and frozen and stored at minus 10 degrees F., its storage life was somewhat shorter than when it was concentrated to one-third its volume. Furthermore, after it was thawed, the 4-to-1 milk was sometimes semi-solid and grainy.

On the basis of their research to date, Bureau scientists conclude that the concentrated milk should be frozen at a rapid rate, that is in a few hours, and stored at not less than minus 10 degrees F., the rate of freezing being less important than the storage conditions.

Moreover, because the protein tends to become insoluble at temperatures above minus 10F., the frozen product should be moved throughout distribution channels at this temperature or lower. In retail stores, in order to avoid the possibility of too long a period of cabinet storage at fluctuating temperatures above minus 10F., it might be desirable to allow the milk to thaw and then handle it like fresh milk.

Frozen concentrated milk is not a new product. In 1934, the Bureau of Dairy Industry was granted a public service patent for a process for concentrating milk to one-third its volume and freezing it at 0 F. This method never gained widespread use, however, because the body and flavor of the milk would not hold up at storage temperatures of 0 F. for long periods. At that time, the Bureau had no facilities for investigating the use of sub-zero temperatures.

During World War II interest developed in frozen concentrated milk for use on hospital ships and in distant places where U. S. troops were stationed, but the product did not prove satisfactory for these purposes because of lack of proper storage conditions.

The recent phenomenal success of frozen concentrated orange juice, together with improvements in refrigeration equipment, has created new interest in the possibility of producing a concentrated milk that can be stored in the frozen state for fairly long periods and that will look and taste like fresh milk when it is thawed and diluted to the same concentration as fresh milk. Advantages of such a product over whole milk would be the saving in storage space, both in home refrigerators and at other storage points, a greater variety of uses, and a longer keeping time. It would also be another means of preserving milk from a period of surplus production to one of scarcity.

Under provisions of the Research and Marketing Act, the Bureau of Dairy Industry is now seeking basic information on the effects of a wide range of processing and storage conditions on frozen milk of different concentrations.

Water Sprays Effective for Cooling Roof Surface

ROOF temperatures that soar as high as 150 F under a blazing summer sun can be cooled down to 100 degrees by the use of a rotating water spray, The American Society of Heating and Ventilating Engineers heard at its 57th annual meeting in the Bellevue-Stratford Hotel January 25.

G. E. Sutton, assistant in research, mechanical engineering department, Engineering and Experiment Station, University of Florida, Gainesville, said the solar radiation on a horizontal surface in his state may be as much as 2300 British thermal units per square foot of surface in one day. This is nearly the heat equivalent of one horsepower-hour, or about two-thirds of the equivalent of one kilowatt-hour.

If the heat received is visualized for an area of 1000 square feet, the need for an effective and economical means of roof cooling can readily be seen. Since temperatures are lower and comfort conditions better within a space below a sprayed roof, Mr. Sutton said, the installation of sprays on air-conditioned buildings will reduce the required refrigeration capacity and thus effect a saving in the cost of materials and insulation.

Sprays are more effective than pooled water for cooling roofs, he declared. By comparison with the 100-degree temperature maintained on the surface of a roof which would reach 150 degrees if unsprayed, 2-inch and 6-inch pools of water on the roof would maintain surface temperatures of 108 and 103 degrees respectively.

"One disadvantage of water pools is the structural difficulties involved in supporting the water, especially on large, flat buildings," said Mr. Sutton. "The large quantity of heat stored in the water is also a disadvantage since a considerable part of it is transfered into the building in the late evening.

"Stagnant pools of water also present ideal locations for mosquito breeding, and for growth of algae."

In Mr. Sutton's installation during the 1949 summer season the 2400 square feet of roof required 85,767 gallons of water between May 20, 1949 and September 30, 1949, or about 35.7 gallons per square foot.

"In some cases, refrigeration coils have been placed just under the roof but in such installations the difference in temperature between the top and bottom of the roof created serious thermal stresses," he declared.

Other findings of Mr. Sutton were:

1—Some reduction in surface temperature of the walls of the building is produced by the spillage of cooled air from the roof.

2—Spray water has a preservative effect on asphalt types of roofing by reducing temperature change and lowering surface temperatures. There is, consequently, less thermal stress, less vaporization of volatile oils than for unsprayed roofs and there is no thermal shock from sudden thunderstorms.

3—Addition of insulation will decrease heat transmission, but will cause an increase in surface temperature, thus adding a deteriorating effect to some types of roofing.

4—The spray system, though simple in design, presents an efficient and economical means of reducing the effects of incident solar energy on roofs.

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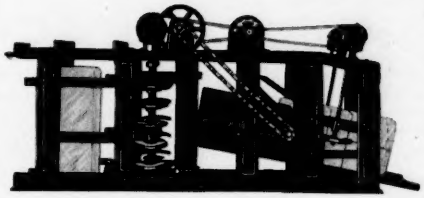

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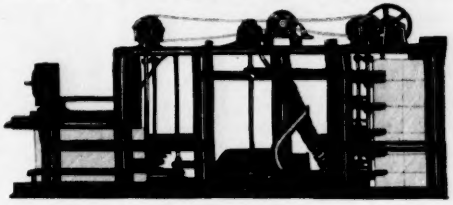

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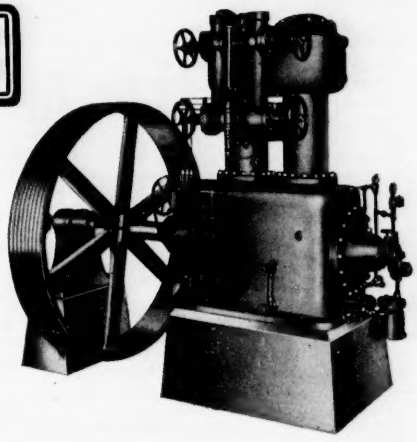

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Good Engineering Pays

(Continued from page 15)

Electricity is entirely purchased in summer. During the winter when steam power is being used for other purposes, most of the load is carried by their steam driven generator, all of the exhaust steam being absorbed for heating. Until the price of oil increased, diesel power was used to generate electricity. But now that steam power is used, they find it maintains good heat balance. The brewery is supplied with 60 kw peak service by the utility company, their diesel powered generator is rated at 50 kw, and their steam engine driven generator at 30 kw.

Records which are kept to analyze operation expenses include the following items: water; power, purchased or generated; fuel, coal or gas. With regard to coal, Clarence Sieben tells how they get accurate measurement. Their original method was to weigh the amount used. However, rain or snow would sometimes saturate the coal and give false indication of the tons burned. They now count the number of wheelbarrows of coal they supply to the boilers, and this gives them greater accuracy.

As mentioned at the beginning of this article, Sieben's Brewery is Chicago's oldest. It has another distinction too. Its bier stube was used for the rectory scene in the Golden Gloves Story, a full length motion picture recently entirely filmed in Chicago. The bier stube was used because with a moderate amount of props it could be made to look like a typical rectory. At the same time it afforded the necessary additional space for paraphernalia and also the ventilation was adequate.

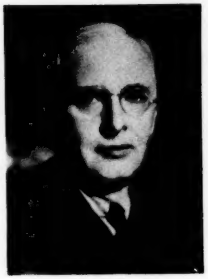
New Cold Storage Freezer Plant in California

CONSTRUCTION of a $500,000 cold storage and freezer plant has been started in the Pasetta Industrial Tract at Santa Clara, Calif. The site comprises eight acres. The plant, which will have approximately 40,000 square feet, is being built by Albert W. Beall, former owner of the Santa Clara Packing Co. He said the Beall Refrigerating Co., will be incorporated for the commercial operation of the plant, which will have 500,000 cubic feet of refrigerated space, and will accommodate 5,000 tons of cannery fruit.

Mechanical equipment will be arranged in such a manner that any of the plant's six rooms can be held at cooler or freezer storage levels.

Chicago Engineer Awarded ASHVE Anderson Medal

THE 1950 F. Paul Anderson Medal of the American Society of Heating and Ventilating Engineers has been awarded to Samuel R. Lewis, consulting mechanical engineer of Chicago, Ill., and the author of several classic textbooks on engineering as well as numerous technical papers and engineering articles, for "outstanding contributions to the advancement of heating, ventilating and air conditioning."



Samuel R. Lewis

The announcement, by Lester T. Avery, president of the society, was made at the ASHVE's 57th annual meeting in the Bellevue Stratford Hotel. He said the award will be presented to Mr. Lewis, a past president of the society, upon his return from abroad. The award was established in 1930 by the late Thornton Lewis (not a relation) of Philadelphia, also an ASHVE past president, and is presented to ASHVE members in recognition of notable scientific achievement or outstanding services in the heating, ventilating and air conditioning field.

Mr. Lewis is the ninth recipient of the medal which is awarded by the Council of the society from nominations submitted by the F. Paul Anderson Committee. Previous recipients have been, the late Dr. Willis H. Carrier, Dr. A. C. Willard, Prof. Frank B. Rowley, Dr. F. E. Giesecke, the late Dr. Ferry C. Houghten, Alfred E. Stacey, Jr., the late James H. Walker and Dr. C. E. A. Winslow.

Mr. Lewis was born in Ottawa, Ill., July 14, 1878. He was graduated from Ottawa High School in 1894 and continued his education in the International Correspondence Schools for which he was later to write texts in heating, ventilating and air conditioning which have been recognized as basic in their field.

He was cited by the society for his "skill in engineering, advancement of the profession through laboratory and field research, professional ethics, inspirational help to younger members of the profession and a complete frankness in sharing his experience and knowledge for the benefit of the profession."

Responsible for the first use of a number of advanced methods which have since become accepted practice in the field, Mr. Lewis is the author of "Air Conditioning For Comfort," one of the first textbooks on the subject, published in 1932, which has been widely used both by practicing engineers and in schools. Other texts of his are "Railway Air Conditioning," "Heating, Ventilating and Air Conditioning," "Piping For Seagoing Vessels," "Plumbing," and "Air Conditioning and Refrigeration," written in collaboration with Prof. Burgess H. Jennings, chairman of the department of mechanical engineering, Northwestern University.

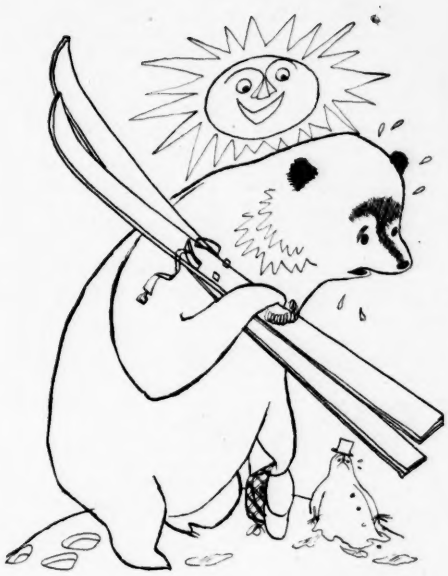
Chicago Section, A.S.R.E.

THE Chicago Section American Society of Refrigerating Engineers held its December 14 meeting at the Bell & Gossett Company plant in Morton Grove, Ill. Approximately 110 members and guests were present. The meeting included buffet dinner in the new addition to the Bell & Gossett Engineering office, in which the new B & G Comfort Controls let the outdoor wind and temperature govern the forced hot water circulation in radiant floor panels. With a snow storm and considerable wind, the heating specialties were fully demonstrated.

The highlight of the visit was the plant inspection tour of the night shift operation. Bell & Gossett products are all directly or indirectly concerned with heat exchange equipment. The Section, therefore, saw all stages of producing heating, industrial, and refrigeration products, and the complex precision operations involved in the manufacture of circulating pumps for water and industrial liquids, relief and pressure reducing valves, a wide variety of water heaters, all applicable to residential, commercial or industrial heating and cooling problems.

Shell and tube refrigeration condensers, evaporators, and heat exchangers were inspected in various stages ranging from 3 to 150 tons capacity. The entire refrigeration line is ASME code certified and largely built with automatic equipment under precision control and uniformity.

Of special interest with present conditions was the temporary re-



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search and testing laboratory where, with a 40-ton freon system, observations and studies under glass were being conducted for the purpose of comparing forced freon flow coefficients with results previously obtained from direct expansion flow in water chillers. A 40-ton compressor was operating in this circuit with abundant thermocouples, pressure gauges and manometers for accurate recording of conditions.

The January meeting of the Section was devoted to consideration of the B9 code by Gerald Gearon, Chief Deputy Inspector of the Department of Boiler Inspection for the City of Chicago. M. C. Turpin, National A.S.R.E. secretary and Dr. D. K. Tressler, National A.S.R.E. treasurer, were guests.

J. J. McKeague, Assistant Chief Deputy Inspector, gave a detailed analysis on criticisms to several sections of the code. In general, the scope, purpose, definitions and refrigeration classifications are satisfactory and criticism mainly was directed to the interpretation or modification in parts of the various sections.

Heating Loads Removed By Cooling Panels

SUBSTANTIAL removal of unwanted heat from a room can be effected by cooling panels even if their temperatures are at or somewhat lower than the room air temperature, Charles S. Leopold, consulting engineer of this city, told The American Society of Heating and Ventilating Engineers at is 57th annual meeting in the Bellevue-Stratford Hotel, Philadelphia, January 22.

This is possible because electric lights and sunlight are sources of high temperature radiant energy which is converted into thermal energy when it strikes surfaces which are at temperatures below their own, Mr. Leopold said. The cooling panels can therefore be maintained at temperatures high enough to prevent the possibility of condensation on their surfaces becoming a source of trouble, he declared.

Effect of Radiation

"A large portion of the heat loads which must be removed from a building is initially in the form of radiation from either electric lights or sunlight, and this radiation has only a small direct effect on heating the air and a large effect on heating the interior surface of the building," said Mr. Leopold. "Radiation from lights and sun has a marked effect on the performance of both air cooling and panel cooling systems."

Cooling panels can be perforated to allow for sound-absorbing media above without materially affecting their thermal performance, he said, but a greater economy in the use of materials may result when only a portion of the ceiling is in the form of panels and the remainder in less expensive materials, such as conventional metal pan acoustic ceilings.

Exploiting the idea of removing as much energy as possible at the source, led to the design of the panels in part as the reflector for a lighting fixture, he said. The performance per unit area of such a panel is higher than a normal ceiling panel since much of the radiation, as well as convected and conducted heat, is directly intercepted before it warms other room surfaces or the room air, he declared.

In an installation now in progress, Mr. Leopold said, the panels used in the ceiling are made to clip into the acoustical dropped ceiling. Flat panels are used around the perimeter of the building to compensate for the sun load, and panels which form the reflector of a recessed fluorescent light are used in all areas to directly remove the heat from the lights. A flat panel, forming part of the wall, is used beneath the window for winter heating and summer cooling.

"Panel cooling is well suited for buildings having large interior zones and may have special application in buildings which employ other methods but have separate areas of illumination requiring high energy levels," he said.

Advantage of Panel System

A major advantage indicated for the panel system, he declared, is the saving in rentable area due to the fact that the air supply is reduced to approximately one-third of that required if the cooling were all done by air, and the consequent saving in vertical and horizontal duct sizes. The simplification of the air distributing problem results in lesser requirements for ceiling heights than conventional systems, he said.

"A further saving in useful area results from not having any apparatus at the windows, other than the flush heating and cooling panel," he pointed out. "The underwindow panel results in a saving of floor area and in making the space directly adjacent to the window more useable because of the freedom from draft and the balancing of radiation."

Mr. Leopold described a system of controls which, he said, differs from the usual in that it does not depend on room thermostats. The temperature of the space is controlled by the elements of the weather and interior load, which would cause the space to heat or cool. These controls anticipate the need for cooling or heating in contradistinction to most controls which make a correction after the heating or cooling effect is noted.

Much of Mr. Leopold's discussion was based on results obtained on a hydraulic analogue, a machine constructed by him for the purpose of solving problems in heat diffusion which are too involved for mathematical solution in a reasonable time.

Canadian Research Board Studies Quality of Fish

SOME of the work being done by scientists to improve the quality of fish entering the domestic and export markets was outlined at the annual meeting of the Fisheries Research Board of Canada.

Dr. Neal M. Carter, director of the Pacific Fisheries Experimental Station, told the meeting that an important adjunct of the station's work on refrigerated vessels is the comparison of tasters' opinions of samples of fish.

By use of the panel, the station hopes to assess consumer appeal of British Columbia fish frozen on board the fishing vessel soon after catching, compared with the same kind of fish packed in ice as is the present common method of bringing fish to port from distant fishing grounds.

The tasting panel includes families of doctors, business men, public health workers and laborers. Members of the panel taste samples of fish which, unknown to them, have been frozen on board the fishing vessel or handled by one or more of the present commercial methods of providing fresh or frozen fish.

Dr. Carter told the meeting that widespread industrial use has been made both in Canada and foreign countries of fish processing machines designed by technologists of the Vancouver station.

Numerous requests have been received for demonstrations of the station's fish reduction unit, shrimp sorting and cleansing apparatus, fish washing machine, and the apparatus for preserving and glazing fish fillets and steaks.

More than 100 inquiries from some 15 foreign countries have arisen from the development at the station of one multi-purpose washing, scaling and sorting machine. Blueprints for the shrimp cleansing apparatus were sent to seven different countries.

Work is being continued on mechanical refrigeration as it relates to fishing vessels, shore plants and railway transportation.

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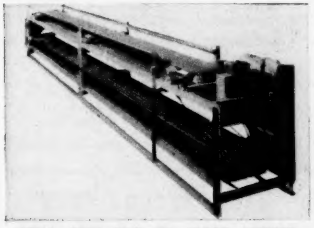

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FACT FINDING CONFERENCE
February 11-13, 1951
Kansas City, Mo.
CLIFF CARPENTER, President

SOUTHWESTERN ICE MANUFACTURERS' ASSOCIATION
February 14-16, 1951
The Hotel Galvez, Galveston, Tex.
P. A. WEATHERRED, Secy.-Counsel

GEORGIA ICE MANUFACTURERS ASSOCIATION
February 21-22, 1951
Ansley Hotel, Atlanta, Ga.
RICHARD W. FLORRID, Secretary

SOUTHERN ICE EXCHANGE
February 21-22, 1951
Ansley Hotel, Atlanta, Ga.
RICHARD W. FLORRID, Secretary

OHIO ASSOCIATION OF ICE INDUSTRIES
February 25-27, 1951
Deshler-Wallick Hotel, Columbus, O.
GUY W. JACOBS, Secretary

NATIONAL ASSOCIATION OF FROZEN FOOD PACKERS
February 26-March 2, 1951
San Francisco, Calif.
L. S. MARTIN, Executive Secretary

MICHIGAN ICE INDUSTRIES ASSOCIATION
March 1-2, 1951
Detroit Leland Hotel, Detroit, Mich.
EDWARD JACKSON, Secretary

INDIANA ASSOCIATION OF ICE INDUSTRIES
March 4-7, 1951
Lincoln Hotel, Indianapolis, Ind.
ROBT. W. WALTON, Secretary

NORTH CAROLINA ICE ASS'N.
March 12-13, 1951
Hotel Charlotte, Charlotte, N. C.
LEWIS H. POWELL, Secy.-Treas.

NORTHWEST ASSOCIATION OF ICE INDUSTRIES
March 29-30, 1951
Vancouver, Canada
L. F. MARSH, Exec. Secy.

New Incorporation

Mineola, N. Y.—Articles of incorporation were filed with the office of the secretary of State, Albany, December 7, 1950 for Mineola Freezer & Storage Co., Inc., to operate a freezer and cold storage warehouse. Capital stock was listed at 200 shares no par value. Directors. Frederick Gohl, Jr., West Hempstead, N. Y.; Charles D. Pacifico, Mineola and Marjorie Furio, Farmingdale, N. Y.

Sales and Reorganizations

Jacksonville, Fla.—Jacksonville Freezers, Inc., has purchased the cold storage division of the Armour & Co. plant at 1851 Talleyrand Avenue., B. W. Bailey, president of the newly organized freezer firm, announced recently. Jacksonville Freezers will operate a freezing and processing plant for cold storage of sea foods, meats and other food products and a warehouse for dry storage. The former Armour building has capacity of 3,000,000 pounds of cold storage in lockers measuring 322,070 cubic feet.

Bay Saint Louis, Miss.—James Burge, manager of the Bay Ice Co. and D. M. Russell Jr., have purchased the business from S. L. Sumrall.

New York, N. Y.—The Rubel Corp. has sold one of its former ice plants, the one-story building at the southeast corner of Rockaway and Lott Aves., Brooklyn, to the Dairy-Rich Charlotte Russe Co. Inc., it was announced recently. Comprising a one-story building on a 40,500 sq. ft plot, the building will be used by the new owners for the manufacture of ice cream.

Barnesville, Ohio—The Barnesville Locker & Storage System on South Chestnut was purchased by Robert B. Barnhardt Jr. The amount of the deal was undisclosed.

Mooreland, Okla.—The Railways Ice Co. has announced the leasing of their Mooreland plant to W. P. Phillips who has acted as superintendent of the local distributing plant for the past eight years.

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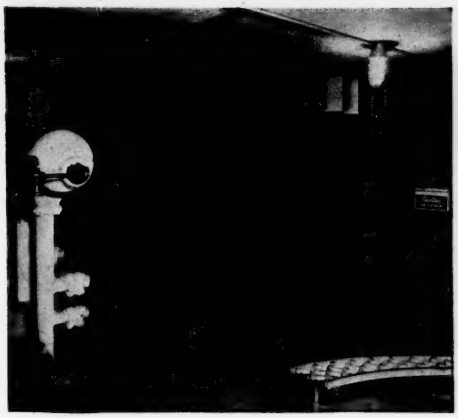

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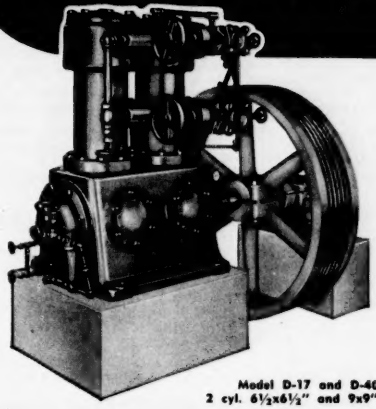

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NEW PLANTS and IMPROVEMENTS

This Department each month presents the more important developments covering new constructions, as well as additions, improvements, remodeling, and installations of new equipment in ice and cold storage plants and other industrial plants that use refrigeration. News notes on all such new constructions and improvements are invited.

California

Los Angeles, Calif.—Terminal Refrigerating Co., is building a one-story palletized freezer room adjoining its present plant. New facilities will handle storage of approximately 2,500 tons of frozen foods, primarily concentrated orange juice and lemonade, according to Harlan J. Nissen, general manager.

Los Angeles, Calif.—U. S. Growers and Shippers Service, Inc., has completed new modern cold storage warehousing facilities here which comprise six rooms totaling 75,000 sq ft of floor area. Frozen and refrigerated products can be handled from 10 F to 40 F in the cold storage rooms. The one story structure was designed for rapid handling of merchandise by fork lift trucks and pallets.

Rio Linda, Calif. — Brothers Ice Company, preparing for the coming season, has completed installation of several S & S ice vending units.

Georgia

Savannah, Ga. — The Georgia Ice Co. is building a steel and concrete addition to its present building on the west side of Harmon street between Wheaton and Rockefeller Streets to cost approximately $20,000.

Illinois

Mattoon, Ill.—A new building to house the company's office and sales room was recently built by The Citizens Coal & Ice Co.

Indiana

Muncie, Ind.—The Marhoefer Division of the Kuhner Packing Co. has started construction of a new building adjacent to its present plant. It will be a three-story building located just north of the existing plant, steel reinforced with concrete and brick construction.

Terre Haute, Ind.—The Vigo Ice and Cold Storage Company, Water and Cherry Streets, has completed installation of modern and scientific ice manufacturing equipment which is capable of producing over 100 tons of ice each day. Water is obtained from the company's deep wells.

Louisiana

Morgan City, Ia.—A new $250,000 quick freeze and storage plant is to be built here by the Louisiana Quick Freezing and Cold Storage, Inc. The organization is building the plant to freeze 60,000 pounds daily with a storage capacity of one million pounds. The new plant is to be housed in two all-metal buildings, the total of both to be 24 feet wide and 200 feet long.

Minnesota

Hopkins, Minn.—As announced in the October 50 issue of ICE AND REFRIGERATION the Merchants Refrigerating Company of New York has acquired a tract of land here for the purpose of erecting a modern public refrigerated warehouse. Ground has now been broken and construction has started on this project which, it is expected, will be completed and in operation by next fall. The new warehouse will have approximately one and three quarters million cubic feet of refrigerated space. It will be of one-floor design, with wide rail and truck loading platforms, palletized handling equipment, blast freezers, sub-zero temperatures, controlled humidities and customer-tenant space.

Missouri

Springfield, Mo. — The Springfield Ice and Refrigeration Co., one of the largest cold storage plants in the state, is planning a $500,000 expansion program.

Nevada

Reno, Nev.—Crystal Ice Co. has completed the installation of three new S & S ice vending machines for dispensing block and packaged ice.

Ohio

Cleveland, Ohio — Another "time tested " S & S vending machine has been set in operation by City Products Corp. for dispensing party ice.

Oklahoma

Tishomingo, Okla. — Texona Ice and Storage Co. has just completed work on structural additions to house poultry processing plant.

Tennessee

Bolivar, Tenn. — Bolivar Strawberry Processing Plant has begun construction of a new freezing unit that will have a capacity for freezing 30,000 lbs. of food every 24 hours and storage for 300,000 lbs.

Washington

Waitsburg, Wash.—Machinery and cold storage equipment for new packing and cold storage plant erected by L. F. Dumas has been installed by W. E. Stone & Co. Inc., Seattle, Wash. Vilter equipment was used.

Fires and Accidents

De Queen, Ark.—Fire caused heavy damage at the plant of Southern Ice, Inc. Water damage to the equipment was estimated to be heavy. A large part of the building will have to be rebuilt.

Willows, Calif. — Weinrich Bros. slaughterhouse east of here suffered fire damages in excess of $2,000, not covered by insurance. The flames were confined to the boiler room.

Tampa, Fla.—A fire, said to have started in the engine room, burned the Seminole Ice Plant at Osborne Ave. and 30th St. to the ground recently. A spokesman for the city fire department said the building was outside the city and a difficulty to get water made it impossible to save the building. Firemen estimated the damage at $100,000, which was about half covered with insurance. A supposedly fireproof safe containing an indefinite amount of cash was burned. The only thing not burned was the ice in the storage room.

Statesboro, Ga.—The plant of the City Ice & Coal Co. was almost totally destroyed by fire. Plans for rebuilding have not been announced.

St. Louis, Mo.—Fire in a brick warehouse behind the Chouteau Avenue Crystal Ice & Cold Storage Plant, caused an estimated damage to the building of $8,000. The fire started in a two-and-one-half-foot layer of sawdust insulation under the roof. Although coolers on the first and second floor contain large amounts of fresh meat, fruits, vegetables and other perishables, the blaze apparently caused little damage to them. The loss was covered by insurance.

Rochester, New York—Fire swept a four-story warehouse of the Rochester Refrigerating Corp. early in the morning, causing $25,000 damage to the building and undetermined damage to about $2,000,000 worth of food stuffs in storage.

Morrisville, Pa.—A fire gutted the storage room of the old ice house of the Consumers Ice Co., on East Bridge Street. The blaze was confined to the storage room. The building has not been used for several years and is owned by D. Baker Cook of Trenton.

Fond du Lac, Wis.—The Sanitary Refrigerator Co. plant was partially destroyed by fire in December. A three-story office building, with most of the company's records, its principal warehouse and most of its stock, including manufacturing parts, were totally destroyed.

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DEATHS

William S. Shipley

THE death of William S. Shipley, chairman of the Board of the York Corporation, York, Pa., occurred Sunday, January 14 at his home in Bayport, N. Y. He was 71 years old.

Mr. Shipley was widely known among the refrigerating industries through his direction of the York Corporation, manufacturers of industrial refrigeration and air conditioning machinery. During World War II, he was director of the Smaller War Plants Corporation established by Congress to acquire war contracts and

William S. Shipley

to split them up to make them available for small businesses. In connection with this he became nationally known for his sponsorship of the "York Plan" which called for the pooling of machine tools and manpower in industrial centers. The Department of Defense had called him to Washington on Friday before his death to discuss similar plans for the present emergency.

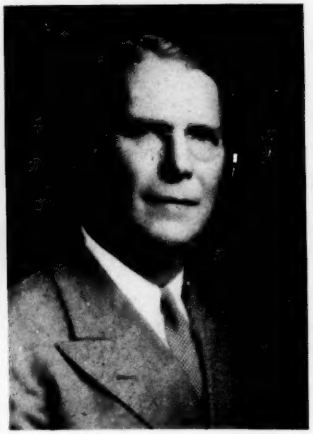
Mr. Shipley was born in Jersey City and was a graduate mechanical engineer of Cooper Union Institute in New York. He started in 1900 as an apprentice with the Diehl Motor Company and the Nash Gas Engine Company, and later became a machinist for the York firm.

In 1904 he joined his brother, the late S. J. Shipley, in the sale of York products in Brooklyn. In 1907 he became vice-president and general manager of the Shipley Construction and Supply Company, an outgrowth of the Brooklyn firm. Twenty years later he became vice-president and general Eastern manager for the York Corporation. He was elected president of the company in 1930 and was made chairman of the board in 1940.

In York, Pa., Mr. Shipley was director of the State Chamber of Commerce, general chairman of the York Welfare Federation from 1934 to 1937 and director of the York Young Men's Christian Association. He was also president of the Refrigerating Machinery Association in 1939 and 1940, a former president of the American Society of Refrigerating Engineers and of the Manufacturers Association of York and a member of the National Association of Practical Refrigerating Engineers.

George W. Glover

THE death of George W. Glover, president and general manager of the Ebner Ice & Cold Storage Co., Vincennes, Ind., occurred December 29 at the Good Samaritan Hospital after two weeks' illness. He would have been 59 January 2.



George W. Glover
(From a 1943 portrait)

Mr. Glover was born and spent his early life in Vincennes and later was located at Shawneetown, Ill., and still later at Cincinnati where he was associated with the Consolidated Coal Company. His wife, Mrs. Laurine Ebner Glover, was a daughter of the late Joseph L. Ebner, founder of the Ebner Ice & Cold Storage Co.

He returned to Vincennes to join the Ebner Company and in 1937 succeeded the late Walter A. Stein as vice president and general manager and served in that capacity until 1949 when he became president and general manager. For many years he had been an active member of the Indiana Association of Ice Industries and of the National Association of Ice Industries.

He is survived by three sons; Ebner Glover, New York; James Glover, Chicago; Lawrence Glover, Louisville; and a daughter, Mrs. Charles Billings, Vermont.

John Avery

JOHN AVERY, president of Roots-Connersville Blower Corp., Connersville, Ind., since 1946, succumbed to a heart attack on January 13. Mr. Avery was a native of Boston, and graduated from the U. S. Naval Academy with the class of 1923. His first industrial experience was with the engineering staff of General Electric.

In 1926, he became a project engineer for Brown-Boveri Company, of Switzerland, and from 1932, until joining Roots-Connersville, he was connected with Allis-Chalmers Manufacturing Co. in Milwaukee. He was active in atomic development work during World War II, and received the Kellex Key for outstanding service. His experience was extensive in the blower and compressor field.

Mr. Avery was a member of the executive board of the Machinery & Allied Products Institute, and a director of the Compressed Air & Gas Institute, with headquarters in Chicago and New York respectively. He was a member of Rotary and the Chamber of Commerce in Connersville, and was extremely active in civic works.

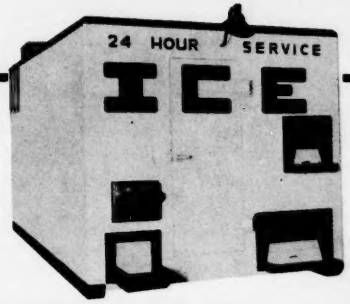
GEO. HAMLEY, Minneapolis, Minn., died recently at the age of 77 years. Mr. Hamley was founder of the Colonial Warehouses, Inc. of Minneapolis, was the first secretary of the Minnesota Warehousemen's Association, and served in many official capacities in the old Central Warehousemen's Club of Minneapolis. He became active in the American Warehousemen's Association when the Central Warehousemen's Club affiliated with A.W.A. in 1924.

GID TALLEY JAMES, who opened the first cold storage plant in Denison, Tex., when he first moved there, died January 11 following a two-year illness. He was 76. Surviving are two daughters, Mrs. Herman Krattiger and Mrs. Ralph Ellsworth of Denison.

ROLAND C. BOND who operated the Hobbs Ice Company, Hobbs, N. Mex., died November 23 at the age of 54 years. Formerly a city councilman, he had been a resident of Hobbs for 24 years.

A. W. SCHRAGE, advertising manager for the J. H. H. Voss Co., Inc., died recently. He had an office in Malvern, Long Island, New York.

$66.50 PER TON



Sell more ice at greater profits and lower sales costs

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ICE VENDING STATIONS and VENDING MACHINES

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★ **DURABLE**—expert engineering and careful construction assures long, trouble-free service.

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Product of F. B. Dickinson & Co.
Highland Park Station—Des Moines, Iowa
Distributed by Manufacturers Sales and Service Co.

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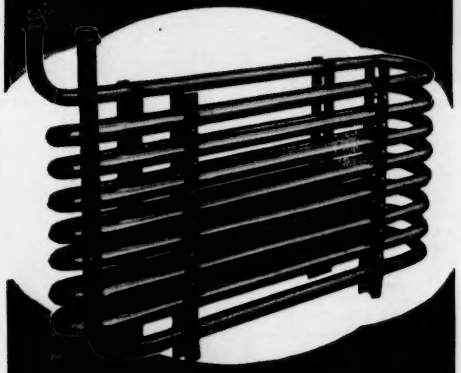
Coils

Smooth Bends
Perfect Welds
Exact Measurements



For over sixty years, the National Pipe Bending Coils have proved their quality in Ice and Refrigeration plants

What's New

MACHINERY APPLIANCES • PROCESSES

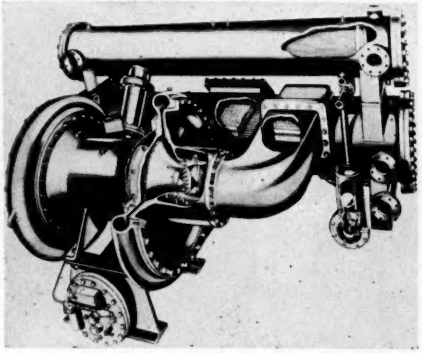
New Hermetic Centrifugal Refrigerating Machine

SUBSTANTIALLY lower operating, maintenance and installation costs for a wide range of comfort and industrial air conditioning systems will result from introduction of the new Trane CenTraVac centrifugal water-chilling unit, according to The Trane Company, La Crosse, Wis.

The CenTraVac's maintenance economies stem from the hermetic sealed design of the two-stage compressor-motor assembly. This eliminates shaft seals, a major source of gas and air leakage and compressor failures. Importance of this feature has been demonstrated by low maintenance costs of earlier Trane Turbo-Vacuum compressors, introduced in 1939. Units of this type have operated through more than five cooling seasons without either internal inspection or operation of their purge pumps. The refrigerant used in the new unit is Freon 113.

Quiet Operation and elimination of vibration are gained through direct drive, which eliminates gear boxes, sources of noise and friction. Impellers for both stages of compression are mounted directly on the constant speed motor shaft. There are only two bearings in the entire unit. These are lubricated by filtered and temperature-controlled oil fed through a positive displacement pump. It can be installed on any floor that will support its dead weight without special foundations with resulting saving in piping layout.

The CenTraVac will be manufactured initially in five sizes covering the general range of 40 to 52 F leaving chilled water temperatures and 80 to 100 F leaving condenser water temperatures. (Design of refrigeration systems for high leaving condenser water temperatures contributes to savings in water consumption). Approximate initial capacity ranges are from 45 to 190 tons refrigeration.



Cutaway drawing shows principal construction features of new Trane hermetic centrifugal refrigeration unit. Hermetic sealed motor-compressor unit (left foreground) is cut away to show impeller and vane assembly of compressor's variable capacity control. Horizontal cylinders to rear are condenser (top) and evaporator (below). It is a 2 stage unit, with the first stage wheel on the right and the high pressure wheel on the left with the motor between. This unit combines centrifugal compression, hermetic sealing and variable capacity.

Gas Engine Driven Compressor

A GAS - ENGINE - DRIVEN compressor, Model SVG, essentially the V-angle XVG compressor, but improved and modernized by a complete redesign is announced by Ingersoll-Rand. The SVG retains all of those features that have been so successful in the earlier models and adds the advantages secured by new materials, modern rotative speeds, and most modern manufacturing methods. This new compressor is built in two sizes, 330 hp with six cylinders and 440 hp with eight cylinders.

New Ingersoll Rand Gas Engine Driven Compressor

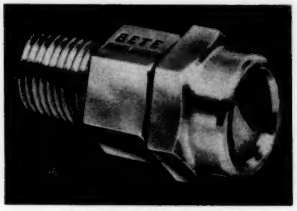
Both sizes weigh about 20 percent less per bhp than the XVG, with no sacrifice in ruggedness or dependability. Foundations are even smaller due to the better balance. These features reduce the installation and relocation costs of the SVG compressor.

Crank angles of 120 deg. on the 6-cylinder unit and 90 deg. on the 8-cylinder unit, two power cylinders per compressor frame, lightweight aluminum power pistons with low inertia forces, and shaft counterweighting make the SVG a smoother running machine, it is claimed.

Necessary controls and valves are grouped at the operating end. A gauge panel with manifold-depression and oil pressure gauges is placed at the same end. The improved governor and shutdown devices give better control with greater operating safety.

Fan Nozzle

MORE uniform coverage with less waste of spray is claimed for the new Bete Fog nozzle introduced by Bete Fog Nozzle, Inc., Greenfield, Mass. Side jets or "horns" containing coarse droplets have been eliminated and the spray pattern made heavier in the center than at the edges of the fan.

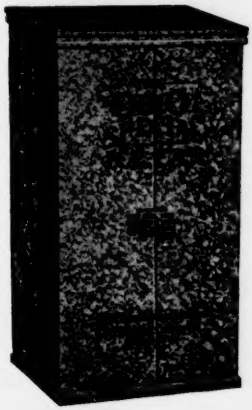


New Bete Fog Nozzle

According to the manufacture, there is less overspraying due to doubling up of the sprays from adjacent nozzles with the result that the combined coverage is uniform.

The Bete "F" Series Nozzles include 13 discs made of long wearing stainless steel with flow rates of 1/10 to 10 gpm and spray angles of 50 to 90 deg. All discs are interchangeable in a brass base and cap assembly having a ¼-in. male pipe connection. Built-in, removable strainers available for smaller nozzles.

OHIO SPECIAL ICE CANS



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Integral Tube Cans
Arctic Pownall Cans
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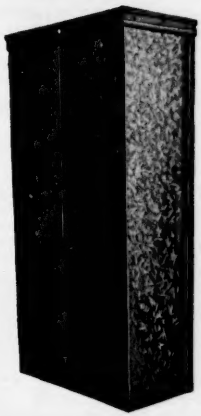

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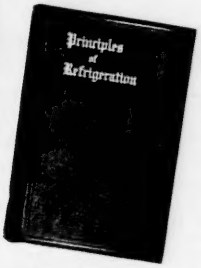

PRINCIPLES OF REFRIGERATION, 3rd Edition (1947) revised by Wm. H. Motz, provides information and data for the practicing refrigeration engineer. Of special interest to erecting and operating refrigerating engineers, refrigeration machinery sales engineers, persons employed in building refrigerating machinery and those employed in ice making, cold storage plants or other establishments equipped with refrigerating machinery. Contains information that the refrigerating engineer should know in order that he may have complete and up-to-date knowledge.

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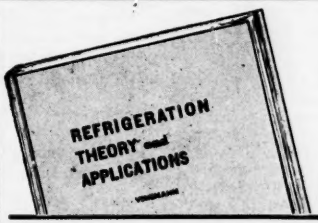

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No other book offers such a comprehensive treatise on the refrigeration theory as applied to the practical uses and applications. An indispensable reference for the student engineer and practical man.

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New Refrigeration Oils For Higher Temperatures

A NEW series of refrigeration oils for higher-operating temperature air-conditioning and refrigerating equipment has been announced by Sun Oil Company. Suniso 300 Oils, especially refined and processed to keep the newer, better running compressors sludge-free and operating at peak efficiency, are described in an interesting folder that has been prepared for distribution by the Sun Oil Company.

"New Refrigeration Oils for Higher Operating Temperatures" briefly presents the reasons and research behind the development of Suniso 300 Oils, and outlines the characteristics of each grade. Copies of the folder are available free on request directed to the company.

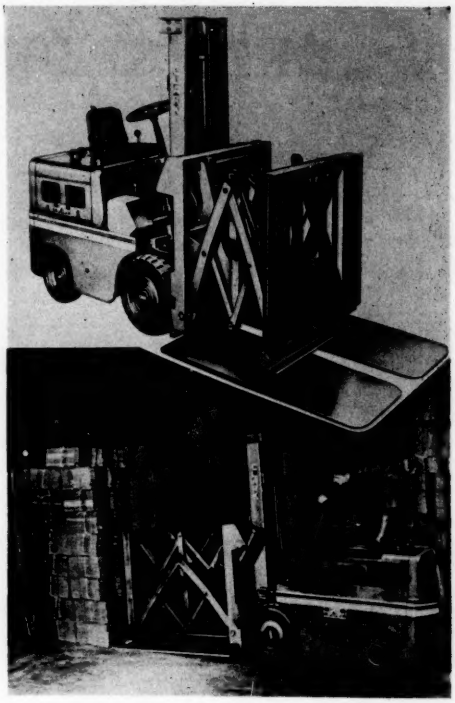
New Pul-Pac Fork Truck Announced by Clark

A REDESIGNED Pul-Pac, fork-truck device that handles unit loads without use of conventional pallets, will go into production during February, according to announcement by Clark Equipment Co. The new model is described as incorporating improvements developed as a result of users' experience.

Principal change from the early design is the adoption of a pantograph-type linkage to actuate the gripper-jaw and pusher rack, in place of the long piston rods employed on previous models. The new construction allows a shorter hydraulic stroke from a more powerful piston, and eliminates the severe bending stresses to which the long pistons were subjected. Strong side forces formerly exerted on the long pistons are now absorbed by the pantograph, which is ruggedly built to withstand them. Also the new construction eliminates all Pul-Pac structure back of the uprights, which contributes to maximum visibility and safety for the driver.

The new equipment can operate in less space than former models. There are no restrictions on tilt of uprights. The unit has a detachable mounting, and is interchangeable with standard forks up to 54-inch usable length.

The rack and gripper-jaw can be lowered slightly when fully extended to engage and grip carrying sheets flat on the floor. The mechanism is easily disassembled for service.



The new Pul-Pac fork truck handling a load without use of conventional pallet. Above an outline picture shows details of the device, and below it is shown in operation.

MANUFACTURERS' NEWS

White House Refrigeration Contract to Worthington

THE contract for refrigeration machines to be used in the air conditioning system of the remodeled White House in Washington, D. C., has been awarded to Worthington Pump and Machinery Corporation, Harrison, N. J., by Reuben L. Anderson, mechanical contractor, according to W. H. Feldmann, vice president in charge of sales of Worthington.

The contract calls for two centrifugal refrigeration systems, each composed of one 200-ton compressor with cooler and condenser. The units will be driven by 250 hp. Electric Machinery synchronous motors through Worthington gears.

DIMCO CAST ALUMINUM FIN EVAPORATING COIL

★ *Saves Space*

★ *Saves Weight*

★ *Saves Cost*

CAN BE USED WITH ANY REFRIGERANT
SALES AGENCIES SOLICITED

Manufactured by

DETROIT ICE MACHINE COMPANY
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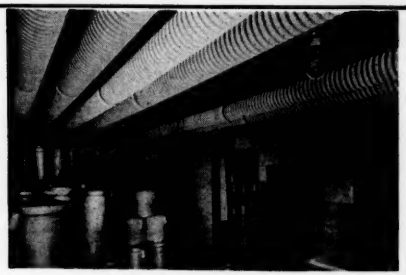

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Corkboard

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Wherever Water Is Used

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Specializing in Water Conditioning
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Sole Distributor of Nelson Chemical Proportioning Pumps

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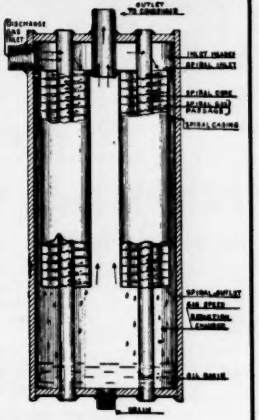
OIL SEPARATOR

STOPS OIL FROM ENTERING CONDENSER RECEIVER AND LOW SIDE

Allows operation as was originally intended. Simple in operation — no parts to wear out — no screens, metal wool or any close screens to clog, raise discharge pressures and cut down capacity.

When used in connection with air compressors, water is also separated with the oil.



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Coils are of selected ammonia pipe—all joints are electrically welded—checked under water with an air pressure of 300 pounds to guarantee tightness.

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Reco Products Expands Manufacturing Facilities

THE expansion of manufacturing facilities at Emporia, Va., has been announced by Reco Products Division, Refrigeration Engineering Corp., manufacturer of walk-in and reach-in freeze coolers and ice making and frozen novelty equipment.

Because of the increasing demand for augmented production facilities due principally to the growth of frozen food and ice cream business, with requirements for prefabricated, sectional freeze coolers and for food conservation in general requiring the use of ice and ice making machines, the management decided to utilize all possible facilities of the Emporia plant, and in the near future to expand by adding additional facilities on the ten acre tract which the plant occupies. The plans for expansion include addition of kiln drying facilities and additional lumber handling equipment, including heavy woodworking equipment.

Reco Products Manufacturing plant at Emporia, Va.

The plant will turn out Reco-Fab Frosti-Vault walk-in coolers, hardening rooms, prefabricated freezing tunnels, frozen stock novelty equipment, as well as ice plant components and junior ice making plants.

The new Emporia plant, which was established in early June of 1950, is located about 60 miles south of Richmond, Va., on Highway 301. It is a modern one story masonry building with private rail siding for ten cars on the ACL roalroad. Headquarters offices of the company will remain in Philadelphia.

Easier and Cheaper with

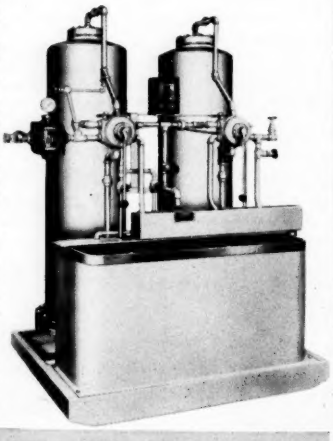
INDUSTRIAL Water Demineralizer

It's worth looking into . . .

The demineralization of water is not something new. It is used in the food industry, in the chemical and other industrial processing where chemically pure water is used in quantity. The very low cost warrants your looking into it.

Here are some of the advantages you get with an INDUSTRIAL demineralizer in ice making. Since the dissolved mineral salts in ordinary water are removed in passing through the ion-exchange resins, core-water removal and replacement is unnecessary. Losses due to cracking are greatly reduced. Freezing at the lower brine temperature increases daily yield. And the bulk of the cake of ice is clearer—your customers will notice that.

If you will send us an analysis of the water you are using, the quantity you need, and at what rate (gallons per hour) we will send you information on INDUSTRIAL demineralizers, estimate of costs, performance data, etc. Better do it now.



A typical two-bed INDUSTRIAL Water Demineralizer. Standard models available with capacities up to 1000 gph. Special units of any capacity engineered to requirements.

FILTERS Pressure Type · PUMPS Centrifugal · CORROSION TESTING APPARATUS Salt Fog • Humidity

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RUBBER DIVISION Vulcanized Linings • Molded Products · WATER DEMINERALIZERS

Baker Names Distributor for Southern California

THE Baker Engineering Corp. has been appointed a prime distributor for Baker air conditioning and refrigeration equipment in the Southern California area by the Baker Refrigeration Corp. of South Windham, Me. The new firm will continue the sales, contracting, manufacturing and service operations that have been performed by the Baker Factory Branch in Los Angeles since its establishment 29 years ago. The business will be carried on from 351 South Anderson Street, Los Angeles.

Officers of the new corporation are C. E. Hollingworth, president and general manager, Hayes T. Cory, vice-president and chief engineer, T. H. Shonfeld, treasurer and assistant chief engineer and Neal S. Templin, secretary. All of the officers except Mr. Templin have been with the Baker Refrigeration Corp. and its predecessor, the Baker Ice Machine Co., for many years.

Mr. Hollingworth has been with the Baker organization for a period of 21 years, the last eight years as general manager of the Los Angeles Factory Branch. Mr. Cory has served Baker for 15 years, five of them as district chief engineer in Los Angeles. During World War II Mr. Cory spent two years in the engineering department of Boeing Aircraft Company in Seattle.

Mr. Shonfeld has had 10 years of

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Keeping up with demands, regardless of season, calls for blowers that deliver positive Volume at required Pressures and Low power cost. You get these essentials to good performance when you install R-C Rotary Positive Blowers, whose dependability has been proved for almost a century. Ask us about your needs or write for free Bulletin 21-B-37.

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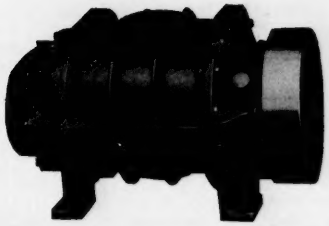

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ONE OF THE DRESSER INDUSTRIES

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This official organ of the British Refrigerating Industry incorporates the two original British Journals *"Cold Storage & Produce Review"* and *"Ice & Cold Storage"*. Now in its 52nd year. *"M.R."* gives the latest reliable technical and practical information.

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Long
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We have been serving the ice industry for 15 years and our customers know that although priced conservatively, our equipment can be depended on for satisfactory performance and economic operation.

It will pay you to investigate our facilities.

ICE PLANT EQUIPMENT CO., Inc.

WRITE OR TELEGRAPH 2543 Frankford Ave. Philadelphia 25, Pa. TELEPHONE NEbraske 4-3055

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TUBE CLEANERS • PUMPS • FILTERS • VALVES • ICE TONGS • THERMOMETERS • ICE PICKS

experience in air conditioning and refrigeration and has been assistant district chief engineer for Baker in Los Angeles since 1946. During the war he was employed in the engineering department of the Bethlehem Shipbuilding Corp., and the United States Navy.

Mr. Templin has been connected with the refrigeration industry since 1922. From that year until 1945 he was employed by the York Corp., and its predecessor companies in San Francisco and Los Angeles in various financial and administrative capacities. From 1946 to the present time he has been the executive secretary of both the Refrigeration and Air Conditioning Contractors Association of Southern California and the Refrigeration Manufacturers Association of Southern California.

By the establishment of this new distributor in Los Angeles, the Baker Refrigeration Corporation is retiring from direct consumer sales and contracting in this area, but it announces that it will continue to maintain a warehouse stock and district office at 351 S. Anderson Street, Los Angeles to serve its distributors and dealers and the trade. This will remain under the direction of C. E. Hollingworth, District Manager.

Cooling Tower Mfrs. Form Institute

THE practical encouragement of all efforts, both governmental and private, toward the conservation of water as America's No. 1 natural resource has been announced as the primary objective of the newly-formed Cooling Tower Institute, according to Raymond C. Kelly, President.

Other objectives of the Institute are to: (1) Support co-operative research toward improving the technology, design, and performance of industrial water cooling equipment. (2) Coordinate recognized engineering groups in developing standardized testing procedures acceptable to manufacturers, users and technical groups. (3) Establish minimum standards of construction. Accumulate technical data of interest to both manufacturers and users of industrial water cooling equipment.

Speaking on the reasons for the formation of the Cooling Tower Institute, Mr. Kelly said, "Emerging in the early 1930's as a separate and distinct industry devoted directly to the conservation of water, the cooling tower industry has grown more than ten fold in 20 years and today finds itself a full-fledged member in the family of major industries."

"Although the present membership of the Institute represents the majority of the manufacturing capacity for industrial-type equipment, we hope eventually to encompass the entire field of both evaporative water cooling and the newly developed air cooled heat exchangers. We have dedicated ourselves, for all industry, to furthering improvements in the technology, design and performance of equipment manufactured for efficiently dissipating to the atmosphere the waste heat developed in power production, chemical manufacture and other industrial processes."

The Cooling Tower Institute was formally organized at a meeting held in Kansas City August 10, the charter membership being composed of seven manufacturers of industrial water cooling equipment. The member companies, their present delegates, and Cooling Tower Institute officers elected for the first term are:

The Fluor Corporation, Ltd., Los Angeles, J. R. Fluor (first vice-president CTI).

Foster-Wheeler Corporation, New York, J. A. Brown (second vice-president CTI).

Hudson Engineering Corporation, Houston, N. B. LauBach.

Lilie-Hoffmann Cooling Towers, Inc., St. Louis, P. R. Hoffmann.

The Marley Company, Inc., Kansas City, L. T. Mart (secretary-treasurer CTI).

J. F. Pritchard & Company, Kansas City, Raymond C. Kelly (president CTI).

C. H. Wheeler Manufacturing Company, Philadelphia, H. R. Baker, Jr.

Advantages of VOSS COMPRESSOR VALVES

LARGER GAS PASSAGE AREA
1. From 20% to 100% increased valve area handles more and colder gas; a colder therefore denser gas costs less to compress.

LARGER VALVE AREA
2. Raises back and lowers head pressure, consequently reduces compression ratio—saving more power.

ELIMINATES SHUT DOWNS
3. Correct design—best materials—careful workmanship—means continuous performance.

SAFE
4. No castings used—therefore no invisible blow-holes or cracks which insures safety of operation. Gas passages drilled, slotted and milled smooth—hence less friction.

LONG LIFE
5. Made to the highest standard of workmanship—on special machines—by craftsmen—in a modern and well equipped shop—designed to give long life under the severest conditions.

NOISELESS
6. Smooth running—with less power—at higher speeds—without overheating.

ECONOMICAL
7. Increased capacity at a definite saving in power—replaces your present valves without any change in your compressor.

DEFINITE SAVINGS after installing J. H. H. VOSS VALVES
REG. U.S. PAT. OFF.

in your compressors

VOSS VALVES are indispensible for use where loads are heaviest; where lower operating costs are important; where safety and reliability are paramount. Increased speed after change over to VOSS VALVES often makes it possible to carry load with one compressor instead of two needed before.

Quotations and estimates on VOSS VALVES furnished on request. Case histories and testimonials of installations similar to your own supplied. Send us the name, bore, stroke and speed of your air, ammonia, or gas compressor of any type or size.

J. H. H. VOSS CO., Inc. 785 East 144th Street NEW YORK 54, N. Y.

THE BUYERS DIRECTORY

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Vogt Machine Co., Henry, Louisville, Ky.

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Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.

AIR COMPRESSORS
Frick Co., Waynesboro, Pa.

AIR CONDITIONING EQUIPMENT
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N.Y.

AMMONIA COMPRESSOR VALVES
Frick Co., Waynesboro, Pa.
Voss, Inc., J. H. H., New York, N.Y.

AMMONIA COMPRESSORS
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA CONTROL DEVICES
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.

AMMONIA FLOAT VALVES
Frick Co., Waynesvoro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA MANUFACTURERS
Armour Ammonia Div., Armour & Co., Chicago, Ill.
Barrett Div., The, Allied Chemical & Dye Corp., New York, N. Y.
Bower Chemical Mfg. Co., Henry, Philadelphia, Pa.
du Pont, Polychemicals Dept., Wilmington, Delaware

AMMONIA MASKS
Acme Protection Equipment Co., Chicago, Ill.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.

AMMONIA PURIFIERS
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA RECEIVERS
Acme Industries, Inc., Jackson, Mich.
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. F., Ridgefield Park, N. J.
National Pipe Bending Co., New Haven, Conn.
Rempe Company, Chicago, Ill.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA VALVES & FITTINGS
Acme Industries, Inc., Jackson, Mich.
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.

ARCHITECTS AND ENGINEERS
Greene, Van R. H., New York, N. Y.
Ophuls & Associates, Fred, New York, N. Y.

AUTOMATIC CONTROL DEVICES
Alco Valve Co., St. Louis, Mo.
Frick Co., Waynesboro, Pa.
Rex Engineering & Sales Co., Oklahoma City, Okla.
Vilter Mfg. Co., Milwaukee, Wis.

BAGS, ICE
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Union Bag & Paper Corp., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

BAGS, WATERPROOF PAPER
Index Coupon & Supply Co., La Porte, Ind.
Union Bag & Paper Co., New York, N. Y.

BEER COOLERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

BLOWERS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

BOILERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

BOILER TUBES
Byers Co., A. M., Pittsburgh, Pa.

BOOKS—TECHNICAL
Nickerson & Collins Co., Chicago, Ill.

BRINE CIRCULATORS
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A.,
Reynolds Mfg. Co., Springfield, Mo.
Roots-Connersville Blower Corp., Connersville, Ky.

BRINE COOLERS
Acme Industries, Inc., Jackson, Mich.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

BRINE SPRAY COOLING
Acme Industries, Inc., Jackson, Mich.
Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A.,

(Buyers Directory continued on next page)

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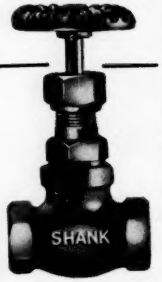

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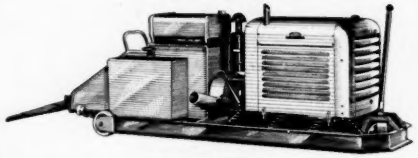

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HARLINGEN, TEXAS

Phone 703

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CALCIUM CHLORIDE
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Ohio Galvanizing & Mfg. Co., Niles, Ohio
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.

CAR ICING EQUIPMENT
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Tri-Pak Machinery Service Inc., Harlingen, Texas

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Acme Industries, Inc., Jackson, Mich.
Byers Co., A. M., Pittsburgh, Pa.
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Creamery Package Mfg. Co., Chicago, Ill.
Detroit Ice Machine Co., Detroit, Mich.
Howe Ice Machine Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.

COLD STORAGE CONSTRUCTION
Armstrong Cork Co., Lancaster, Pa.
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

COLD STORAGE DOORS
Butcher Boy Cold Storage Door Co., Chicago, Ill.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Jamison Cold Stge. Door Co., Hagerstown, Md.

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(See Ice Making and Refrigerating Machinery)

CONDENSERS
Acme Industries, Inc., Jackson, Mich.
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Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
King-Zeero Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

CONSULTING ENGINEERS
Greene, Van R. H., New York, N. Y.
Ophuls & Associates, Fred, New York, N. Y.

CONVEYORS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.

COOLING TOWERS
Frick Co., Waynesboro, Pa.
Vilter Mfg. Co., Milwaukee, Wis.

CORK INSULATION
Armstrong Cork Co., Lancaster, Pa.
Luse-Stevenson Co., Inc., Chicago, Ill.

CORROSION CONTROL
Wright Chemical Control Corp., Chicago, Ill.

COUPON BOOKS
Index Coupon & Supply Co., La Porte, Ind.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

COVERINGS (PIPE AND BOILERS)
Armstrong Cork Co., Lancaster, Pa.

CYLINDERS (GAS & LIQUID)
Byers Co., A. M., Pittsburgh, Pa.

DEIONIZING EQUIPMENT
Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.

DEMINERALIZING EQUIPMENT
Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.

DIP TANKS AND CAN BASKETS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Vogt Machine Co., Henry, Louisville, Ky.

DRIVES, TRANSMISSIONS
Frick Company, Waynesboro, Pa.

ELEVATING & CONVEYING MACHINERY
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.

ENGINEERS AND ARCHITECTS
(See Architects and Engineers)

ENGINES
Frick Co., Waynesboro, Pa.

EVAPORATIVE CONDENSERS
Niagara Blower Co., New York, N.Y.

EVAPORATORS
Acme Industries, Inc., Jackson, Mich.
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Niagara Blower Co., New York, N.Y.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

FEED-WATER HEATERS
National Pipe Bending Co., New Haven, Conn.
Vogt Machine Co., Henry, Louisville, Ky.

FIBERGLAS
Armstrong Cork Co., Lancaster, Pa.

FIELD ICE SAWS
Gifford-Wood Co., Hudson, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

FILTERS, CLARIFYING
Industrial Filter & Pump Mfg. Co., Inc., Chicago, Ill.

FILTERS, WATER
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Industrial Filter & Pump Mfg. Co., Inc., Chicago, Ill.
Martocello & Co., Jos. A., Philadelphia, Pa.

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Acme Industries, Inc., Jackson, Mich.
Howe Ice Machine Co., Chicago, Ill.
Rempe Company, Chicago, Ill.

FIRST AID SUPPLIES
Acme Protection Equipment Co., Chicago, Ill.

FITTINGS
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

FOOD FREEZING EQUIPMENT
Howe Ice Machine Co., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

FROZEN FOOD LOCKERS
Knickerbocker Stamping Co., Parkersburg, W. Va.

FUEL OIL PRE-HEATERS
National Pipe Bending Co., New Haven, Conn.
Rempe Company, Chicago, Ill.

HAND TRUCKS
Ohio Galvanizing & Mfg. Co., Niles, Ohio

HOISTING APPARATUS
Capital Elevator & Mfg. Co., Columbus, Ohio
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Reynolds Mfg. Co., Springfield, Mo.

HUMIDITY AIR CONDITIONERS
Niagara Blower Co., New York, N.Y.

ICE BAGS
Union Bag & Paper Corp., New York, N. Y.

ICE BLOWERS
Gifford-Wood Co., Hudson, N. Y.

ICE CANS
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Ohio Galvanizing & Mfg. Co., Niles, Ohio

ICE CAN FILLERS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Vogt Machine Co., Henry, Louisville, Ky.

ICE CHIPPERS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CHUTES
Frick Co., Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Jamison Cold Storage Door Co., Hagerstown, Md.
Martocello & Co., Jos. A., Philadelphia, Pa.

ICE CONVEYORS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

ICE CREAM PLANTS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

ICE CRUSHERS
Bateman Foundry & Machine Co., Inc., Mineral Wells, Texas
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Martocello & Co., Jos. A., Philadelphia, Pa.
Micron, Inc., Bettendorf, Iowa
Tri-Pak Machinery Service Inc. Harlingen, Texas
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBE CONTAINERS
Index Coupon & Supply Co., La Porte, Ind.
Union Bag & Paper Co., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBERS
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBING MACHINES
Gifford-Wood Co., Hudson, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

ICE DELIVERY BAGS
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Martocello & Co., Jos. A., Philadelphia, Pa.
Union Bag & Paper Corp., New York, N. Y.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE ELEVATORS AND CONVEYORS
Capital Elevator & Mfg. Co., The, Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.

ICE HARVESTING MACHINERY & TOOLS
Gifford-Wood Co., Hudson, N. Y.
United Ice & Oil Supply Co., Boston, Mass.

ICE MAKING AND REFRIGERATING MACHINERY
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Ice Machine Co., Detroit, Mich.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Company, Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
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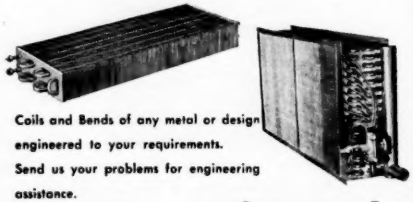

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REMPE COMPANY
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THE BUYERS

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ICE PICKS AND PLANERS
Gifford-Wood Co., Hudson, N. Y.
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United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE PICK SCABBARDS
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Martocello & Co., Jos. A., Philadelphia, Pa.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE PICK VENDING MACHINES
United Ice & Oil Supply Co., Boston, Mass.

ICE PLANTS
Enterprise Equipment Corp., Yonkers, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.

ICE SCALES
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE TOOLS
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Martocello & Co., Jos. A., Philadelphia, Pa.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE VENDORS
Dickinson & Co., F. B., Des Moines, Ia.
Frick Company, Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Jamison Cold Storage Door Co., Hagerstown, Md.
S & S Vending Machine Co., San Jose, Calif.
United Ice & Oil Supply Co., Boston, Mass.

INSTANTANEOUS HEATERS
National Pipe Bending Co., New Haven, Conn.

INSULATING MATERIALS
Armstrong Cork Co., Lancaster, Pa.
Luse-Stevenson Co., Inc., Chicago, Ill.
Pacific Lumber Co., San Francisco, Calif.

LOW TEMPERATURE EQUIPMENT
(See Ice Making and Refrigerating Machinery)

MASKS, AMMONIA
Acme Protection Equipment Co., Chicago, Ill.

MATERIALS HANDLING EQUIPMENT
Ohio Galvanizing & Mfg. Co., Niles, Ohio

OIL AND LUBRICANTS
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

OILS, CUTTING
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

OIL SEPARATORS
King-Zeero Company, Chicago, Ill.
Rex Engineering & Sales Co., Oklahoma City, Okla.

OILS, FUEL
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

PACKINGS
Frick Company, Waynesboro, Pa.
Vivian Mfg. Co., St. Louis, Mo.

PIPE COILS AND BENDS
Acme Industries, Inc., Jackson, Mich.
Chicago Nipple Mfg. Co., Chicago, Ill.
Frick Company, Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

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Acme Industries, Inc., Jackson, Mich.
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Philadelphia Pipe Bending Co., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

PIPING
Acme Industries, Inc., Jackson, Mich.
Byers Co., A. M., Pittsburgh, Pa.
Frick Company, Waynesboro, Pa.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

PRESSURE BLOWERS
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

PROPELLERS
Ice Plant Equipment Co., Inc., Philadelphia, Pa.

PUMPING MACHINERY
Aurora Pump Co., Aurora, Ill.
Deming Co., The, Salem, Ohio
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Layne & Bowler, Inc., Memphis, Tenn.
Roots-Connersville Blower Corp., Connersville, Ind.

PUMPING MACHINERY—AIR LIFT
Deming Co., The, Salem, Ohio
Roots-Connersville Blower Corp., Connersville, Ind.

PUMPS, AMMONIA AND BRINE
Deming Co., The, Salem, Ohio
Frick Company, Waynesboro, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.
Vogt Machine Co., Henry, Louisville, Ky.

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PURGERS
Frick Company, Waynesboro, Pa.
Rex Engineering & Sales Co., Oklahoma City, Okla.

RAW WATER FREEZING SYSTEMS
Frick Co., Waynesboro, Pa.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

REBOILERS
Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

REFRIGERATED ICE STATIONS
Dickinson & Co., F. B., Des Moines, Ia.
S & S Vending Machine Co., San Jose, Calif.

REFRIGERATING AND ICE MAKING MACHINERY
(See Ice Making and Refrigerating Machinery)

RESPIRATORS
Acme Protection Equipment Co., Chicago, Ill.

RUST PREVENTATIVES
Bower Chemical Mfg. Co., Henry, Philadelphia, Pa.
Wright Chemical Corp., Chicago, Ill.

SCORING MACHINES
Frick Company, Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Perfection Ice Scoring Machine Co., Fort Worth, Texas
United Ice & Oil Supply Co., Boston, Mass.

SECOND HAND MACHINERY AND SUPPLIES
Enterprise Equipment Corp., Yonkers, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
United Ice & Oil Supply Co., Boston, Mass.

SEPARATORS OIL, STEAM AND AMMONIA
Acme Industries, Inc., Jackson, Mich.
Frick Company, Waynesboro, Pa.
King-Zeero Company, Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

SHOULDER PADS
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

SIZED ICE EQUIPMENT
Bateman Foundry & Machine Co., Inc., Mineral Wells, Texas
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Vivian Mfg. Co., St. Louis, Mo.

SPRAY NOZZLES
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.

SPRAY PONDS
Frick Company, Waynesboro, Pa.

STORAGE HEATERS
National Pipe Bending Co., New Haven, Conn.

STRAINERS
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.

TANKS
Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

TARPAULINS
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
United Ice & Oil Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

THERMOMETERS
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Martocello & Co., Jos. A., Philadelphia, Pa.

TIERING MACHINES
Capital Elevator & Mfg. Co., The, Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.

TRAPS, OIL & STEAM
Rex Engineering & Sales Co., Oklahoma City, Okla.

UNIT COOLERS
Acme Industries, Inc., Jackson, Mich.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N.Y.

USED MACHINERY
Enterprise Equipment Corp., Yonkers, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.

VALVES AND FITTINGS
Alco Valve Co., St. Louis, Mo.
Frick Company, Waynesboro, Pa.
Henry Valve Co., Chicago, Ill.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Martocello & Co., Jos. A., Phi.adelphia, Pa.
Rempe Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

WATER COOLERS
Acme Industries, Inc., Jackson, Mich.
Niagara Blower Co., New York, N.Y.

WATER SUPPLY CONTRACTORS
Layne & Bowler, Inc., Memphis, Tenn.

WATER TREATMENT MATERIALS
Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.
Wright Chemical Corp., Chicago, Ill.

WELDING
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Philadelphia Pipe Bending Co., Philadelphia, Pa.
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USED ICE MACHINES AND EQUIPMENT

All Used Equipment Is Reconditioned In Our Modern Machine Shop

THIS IS ONLY A PARTIAL LIST-WRITE ABOUT ANY REQUIREMENTS WHICH YOU HAVE WE ARE BUYING ADDITIONAL EQUIPMENT ALL OF THE TIME

Compressors With or Without Motors

	Item No.
1—4x4 York, 300 RPM	16
6—6x6 York's, 200 RPM	20
1—6x6 Frick, 257 RPM	21
2—6x6 York's, 400 RPM, forced-feed lubrication	25
2—6½x6½ Arctics, 350 RPM, forced feed lub.	30
1—7¼x7¼ Baker, 350 RPM, forced feed lubrication	35
1—7x7 Frick, 200 RPM	40
1—7½x7½ York, 200 RPM	51
2—7½x7½ Yorks, 350 RPM, forced-feed lubrication	54
1—7½x7½ York, 400 RPM, forced-feed lub. Late Type	55
1—8x8 Frick, 400 RPM forced feed lub. V-belt wheel	57
1—8x8 York, 400 RPM, forced feed lub., V-belt wheel	58
1—9x9 Arctic, 300 RPM, forced feed lub.	62
1—9x9 York, 200 RPM	71
1—9x9 Worthington, 325 RPM, forced feed lub.	72
1—10x10 De La Vergne, 360 RPM, forced feed lub.	73
1—10x10 York, 257 RPM, forced feed lub.	80
1—10x10 Carbondale, 100 HP synch. motor, 350 RPM	81
3—10x10 York's, 225 RPM, semi-forced feed lub.	82
1—11x13 York, 164 RPM, forced feed lub.	90
2—12x12 Frick, direct conn. 150 HP synch. motor	98

Diesel Driven and Diesel Engines

1—8x8 York—Direct connected to 50 HP Fairbanks-Morse at 257 RPM	210

Steam Driven

1—8x8 Vertical York, 300 RPM direct connected	327

Pipe

10,000 feet wrought Iron pipe—2"—like new	451

Complete Ice Plants

1—15-ton electric driven plant	630
1—600 Can Trunk Coil Type—York Plant, Brand New Tank. *Complete with 10 Can Grids. This plant is equal to new*	631
Brand New 8 to 10-ton Clear Ice-Making Plants—110 Cans—Electric or Diesel Drive—2 Can Pull	632
1—*247 Can, 22-ton ice plants, like new*	632A
1—35-38 ton New Clear Ice Making Plants	635
1—150 Ton Multi lift—1622 Can Plant	636
1—702 Can Plant—9 Can Pull	637
1—920 Can Plant—12 Can Pull	638
1—150 Ton Ice Plant—2 Tank	660

Traveling Cranes

2—4 Ton Overhead Traveling Cranes. 9 & 12 Can Grid.

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3—4x4 York & Fricks	742
1—5x5 York—390 RPM	743
1—4½x5 Lipman—360 RPM	744
1—3x3 Worthington	748
1—5x5 Frick—Forced Feed—400 RPM Latest Type	758

Used Ice Cubers

1—300 lb. ULINE, fully automatic cuber	501
1—50 lb. F & E Safety Cuber	502

Condensers

3—100 ton shell and tube condensers retubed	919
1—125-ton, Vertical Shell & Tube, 196 2" tubes	921
1—120 ton, 216—2" retubed Vertical Shell & Tube	922
2—20 ton Horizontal—retubed	924

Ice Cans

2000 Cans—Like new—11"x22"x47"	950

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RIDGEFIELD PARK, N J

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- Cuts labor cost 75% over hand cleaning.
- Reduces power cost — head pressure drops at once.
- Heat transfer between condensing water and ammonia greatly increased.

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ELECTRIC TUBE CLEANERS

Completely remove mud, algae and scale. No shut-down required when cleaning open type shell and tube condensers. Big reduction in shut-down time when cleaning enclosed shell and tube condensers. Cleaning made easy — prompts cleaning more often.

All kinds tube cleaning equipment—air, water, steam or hand powered. Write for details.

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INCREASE YOUR PROFITS BY DELIVERING FRESHLY BROKEN ICE IN SIZES FOR ALL NEEDS RIGHT AT THE DOOR

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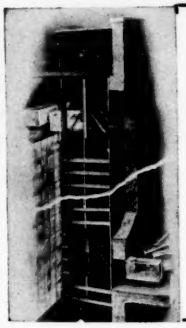

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All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: $3.50 for 30 words or less; 60c for each additional 10 words or fraction thereof; 75c per line for bold face headings; $6.00 per inch for line listings.

POSITIONS AND HELP WANTED

POSITION WANTED — Warehouse executive, presently employed as general manager; aggressive and forward looking; twenty years experience general merchandise and refrigerated storage; interested in relocating, Central States preferred. Address Box JA-6, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

WANTED—FRICK FACTOR is desirous of retaining on profit sharing basis a refrigeration and air conditioning engineer capable of estimating, supervising installation department, training salesmen in basic fundamentals, and in general promoting sales of refrigeration and air conditioning equipment. Engineering of air conditioning contract work will be of prime importance. Address Box FB-2, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

ICE PLANTS—for sale

FOR SALE—Zenith 3 ton portable ice plant, with 10 ton motor and extra compressor for storage room. Can operate at present location or move. Write Zenith Ice Co., Box 414, Garden City, Kansas.

FOR SALE—at sacrifice—two 30 ton York ice plants; just shut down; everything in excellent condition. Must vacate building. For further information, please write or wire Box 642, Central Y.M.C.A., Reed & Washington Sts., Reading, Pa.

FOR SALE—Small modern ice plant in Southern California, completely equipped; automatic tubular ice making machine. Now serving over 200 commercial stops exclusively with seven good routes. Will net over $1,000.00 per month. Write owner for appointment at Box No. 2-A, c/o Duane Wanamaker, 610 South Broadway, Los Angeles 14, Calif.

FOR SALE—Complete 100 ton plant, 1100 can 11"x22"x54". Excellent condition; with a 22 can lift, 6½ ton crane, multi-pass condensers, slow speed DeLaVergne, two 10x10 Fricks, pumps, tank coils, filling tank and vertical agitators. All electrical equipment is 25 cycle. Address Box DC-10, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE
COMPLETE ICE MAKING PLANT

Two 3 h.p. York Freon compressors with condenser units, copper ice tank coils, low pressure air system complete with 50 ice cans and air agitators. This plant is in good operating condition. What will you offer F.O.B. Jamestown, New York?

HOTEL JAMESTOWN
Jamestown **New York**

USED MACHINERY—wanted & for sale

FOR SALE—immediate shipment—3 Frick 606 compressor units. 3 Frick 404 compressor units. Baker 9¼x9¼ high speed. York 9x9 slow speed. Miscellaneous motors, condensers and ice plant equipment. New Hoffman L.R. 25 blower, direct connected to 5 h.p. motor, with blast gate and foundation strips. Write P.O. Box 367, Fort Worth 3, Texas.

USED MACHINERY—continued

FOR SALE—1500 ice cans 11x22x47-48—good condition, $2.25 each F.O.B. 1500 brass drop tubes 50c each. C. Hoffberger Company, 1517 N. Gay St., Baltimore 13, Maryland.

FOR SALE—Brand new latest type ammonia compressors. One 8"x8" Frick, two 5"x5" Worthingtons, one 5½"x5½" Vilter, all with V belt drives; also new 60 h.p. motor. All just as received from the factories. Address Box FB-5, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—1 Model 42F 8¾x10½, 3 cyl. Fairbanks-Morse Diesel engine complete with 60 K.W. 3 ph. 60 cyl. 220 alternator and switchboard. 1 Model 32E14, 14x17 75 h.p. Fairbanks-Morse Diesel engine complete with 50 h.p. alternator 3 ph. 60 cyl, 220 volts and switchboard. All in good condition. Priced to sell. Superior Dairy Inc., RFD 1, Canton, Ohio.

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Carload of used cork—1½" and 2" thick in assorted sizes.
AARON EQUIPMENT COMPANY
1347 S. Ashland Ave. Chicago 8, Ill.

FOR SALE—One 160' level double deck two-way belt conveyor with 34", four-ply, 32 oz. rubber filled belt; also pulleys, guards, supports and 10 h.p., 1725 r.p.m, 3 phase, 60 cycle, 220 volt, AC, gear motor, with output speed 42 r.p.m. Magnetic starter. Port Everglades Refrigeration Co., Fort Lauderdale, Fla.

FOR SALE—A number of 9x9, 6x6, 5x5 and smaller sizes in standard and self contained units. Shell & tube condensers and brine coolers, ammonia receivers, oil traps, agitators, blowers, coils, new and rebuilt fittings, oil engines, generators, motors. Parke, Pettegrew & Son Co., 370 W. Broad St., Columbus 8, Ohio.

FOR SALE—1 York ammonia V-type coil evaporator (apr. 40 TR cap. at 10° TD) with 5 h.p. vertical agitator suction traps and L.P. float. 1—20" dia. x 8' ammonia receiver. 1—16" dia. x 16' S. & T. closed condenser. Columbus Refrigeration Co., 352 N. High St., Columbus 15, Ohio.

FOR SALE—One 30 ton York evaporative condenser. One 10 ton York floor type room cooler with float control. 6x6 and 7½x7½ high speed York compressors. One 3x3 Frick and one 4x4 York, self-contained unit. 3x3, 4x4, 5x5, 6x6, 6½x6½, 7½x7½, 8x8 and 9x9 York splash lubrication compressors. Two 25-ton York horizontal shell & tube condensers. Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE—ICE PLANTS & EQUIPMENT

1—60 ton York ice plant
1—30 ton York ice plant
1—20 ton York ice plant
1—10 ton York ice plant
1— 5 ton York ice plant

AMMONIA COMPRESSORS

2—10x10 Carbondales, 300 r.p.m. with 100 h.p. synchronous motor.
1—10x10 York 360 r.p.m.
2—10x10 Yorks 225 r.p.m.
1—9x9 York 300 r.p.m. with synchronous motor.
1—9x9 Frick 250 r.p.m.
1—8x8 Frick 360 r.p.m.
1—8x8 Creamery Package 360 r.p.m. with 40 h.p. motor.
1—7½x7½ York 360 r.p.m. with 40 h.p. motor.
1—6½x6½ York 360 r.p.m.
1—6x6 Frick 360 r.p.m.
1—5x5 York self-contained unit.
1—4x4 York self-contained unit.
1—Uline ice scoring machine.

Send us your requirements on any equipment you may need.

B & E REFRIGERATING CO.
2 Orange St., Newark 2, N. J.
Phone—Mitchell 3-7790 Cable Address "BERECO"

USED MACHINERY—continued

FOR SALE—Vertical shell and tube condenser, 225 tons capacity, 4'x14'. Fifteen stands atmospheric condensors 10' long, 12 pipes high. Two ammonia pumps. Very reasonable. Snow Ice Co., 4555 W. Monroe St., Chicago 24, Ill.

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First-class condition; Dallas plant converting to dry storage. Frick compressors, 10x10, 9x9, 6x6; Bruce 180 & 165 H.P. engines. 125 KVA AC generators, etc. Catalogue on request.

A A A IRON & METAL CO.
2401 Canton **Dallas, Texas**

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20-40-50-60-Ton Ice Plants—Immediate Sale
1—12"x12" Duplex Frick Ammonia Compressors direct connected to synchronous motor
1—10"x10" York ammonia compressor direct connected to 60 H.P. synchronous motor 200 R.P.M.
1—10"x10" York ammonia compressor direct connected to 100 H.P. synchronous motor 200 R.P.M.
1—9"x9" ammonia compressor direct connected to 50 H.P. synchronous motor 200 R.P.M.
1—10"x10" York ammonia compressor 200 R.P.M.
1—8"x8" York ammonia compressor direct connected to 60 H.P. synchronous motor 360 R.P.M.
1—8"x8" York Ammonia Compressor High Speed
1—6"x6" York Ammonia Compressor High Speed
1—5"x5" York Ammonia Compressor High Speed
Can supply motors for all compressors.
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2—4"x4" H.S. self contained Units, York
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2—Gifford & Wood Creasey Ice Crushers, Various sizes.
3—Scoring Machines Perfection.
2—Sheppard Cranes 4 and 5 ton capacities—3 motor jobs.
1—Sheppard Crane 4 ton capacity—3 motor job.
2000—Ice Cans, various sizes.
Brine Coolers, double pipe 2" and 2" horizontal brine coolers, submerged shell and tube type, 1½" and 2" ammonia coils, approximately 10,000 feet.

Send us your requirements on any equipment you may need.

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Phone: Yonkers 8-8118-9
77-79 Alexander St., Yonkers, N. Y.
Cable Address: ENEQCO

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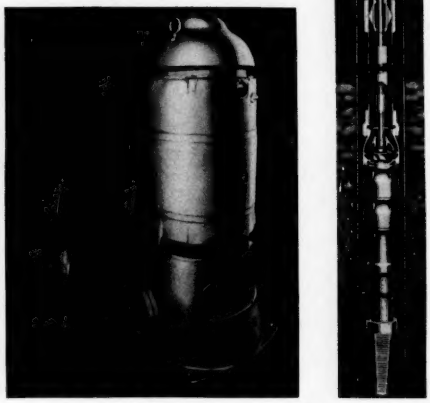
. . . don't waste it by looking around for personnel or items to make your organization more efficient. A classified ad in Ice and Refrigeration will do the job for you quickly and at low cost. No matter what you need or have to sell, one of our readers will have it or want it. The same goes for personnel.

Rates are shown at the top of the page — closing date is the fifteenth of the month.

May we serve you?

Features of Deming Deep Well, Water Lubricated, Turbine Pumps assure low operation and maintenance costs. The end result is low water costs for any plant.



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Accurate alignment between motor, column, and shaft assembly . . . adjustable impeller clearance . . . water lubrication of tough, wear-resistant, cutless rubber bearings . . . highly polished stainless steel shaft sleeves . . . high strength, turned, ground, and polished line shaft . . . those and many more features assure sustained high standards of performance for every Deming Deep Well Turbine Pump.

For full details, write for 24-page, 3-color, illustrated BULLETIN 4700.

THE DEMING COMPANY • 529 Broadway, Salem, Ohio

Deming

DEPENDABLE PUMPS

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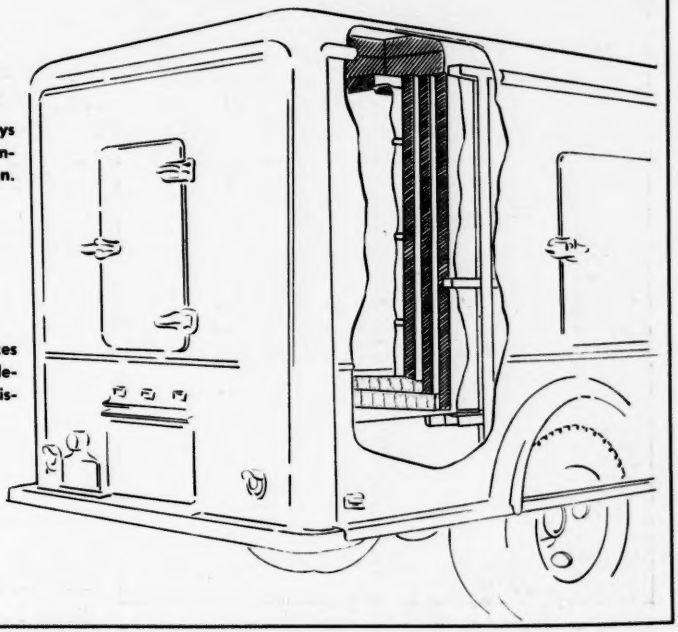
CORKBOARD

Helps to support load. Stays dry and efficient in this unsealed type of construction.

FIBERGLAS

Light in weight, it reduces dead weight. Resists the deteriorating effects of moisture and ice.



WHAT IS THE BEST INSULATION FOR A TRUCK BODY?

Before you can decide on the best combination of insulation materials for a truck body, you must first analyze the service requirements of the body. Operating temperatures—products carried—gross weight of vehicle—average length of hauls—all help to determine the best combination of insulations to use.

The sketch above shows one effective combination of materials for the body of a heavy-duty truck. This type of vehicle usually transports ice cream on fairly long hauls. Operating temperatures are 0° F. and below.

Sidewalls and top of the body are insulated with 6″ of Fiberglas*. This material was selected because it is light in weight—thus helps to keep dead weight at a minimum. It also provides ample insulation to control temperature during the day's run. Fiberglas doesn't sag or settle under vibration. It is inorganic, and moisture and ice do not cause it to deteriorate.

Armstrong's Corkboard was used to insulate the floor because it helps to support the load being carried and reduces the number of cross members required. It compresses very little — cushions loads against road shocks and helps protect the body. In hot weather, it retards the heat rising from the road. Its natural moisture resistance keeps cork dry and efficient despite the severe conditions of refrigerated truck service.

If you have a problem concerning the insulation of refrigerated equipment, experienced engineers in Armstrong's district offices will gladly go over it with you. These men can suggest a highly efficient combination of materials for your equipment because they have a complete line of insulations from which to select. They can also arrange to test your equipment in Armstrong's Life Test Room. Call the Armstrong office nearest you or write to Armstrong Cork Co., 4502 Queen St., Lancaster, Pa.

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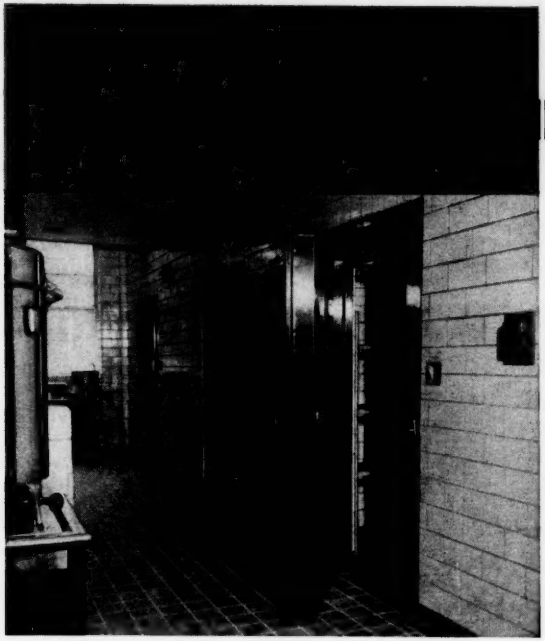
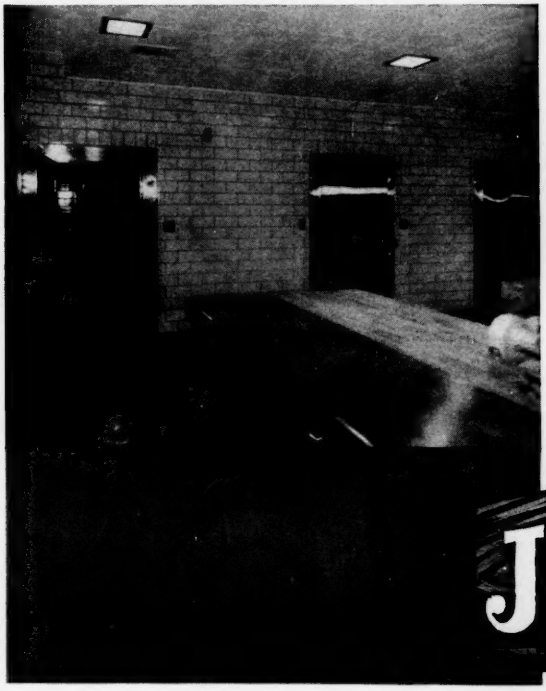
LK CORKBOARD • FIBERGLAS • TEMLOK



Jamison Stainless Steel Clad Cold Storage Doors Match the Beautiful, Sanitary, Modern Equipment in the New Kitchen at Mt. Sinai Hospital, Cleveland, Ohio.



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For Cold Storage Use in Institutional Kitchens

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JAMISON

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